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THE
GEOGRAPHICAL REVIEW

VOL. VIII OCTOBER-NOVEMBER, 1919 NO. 4-5

THE NORWEGIANS IN SPITSBERGEN*

By CHARLES RABOT
Société de Géographie de Paris

[With Figs. 3 and 4 on Pl. III facing p. 212 and Figs. 13, 14, and 15 on Pl. IV facing p. 224.]

Several papers concerning Spitsbergen have recently been published, but they are incomplete and inaccurate, their authors being unaware of the great work done by the Norwegians in this archipelago and of the recent historical research work of the Dutch. It may therefore be useful to attempt to present a comprehensive account of geographical progress in Spitsbergen and of the industrial development of this polar land as well as its political history.

ICE CONDITIONS ON SPITSBERGEN COASTS

Owing to the climatic effects of a branch of the Gulf Stream, the western coast of Spitsbergen and the westernmost part of its northern coast are usually ice-free from July to October. Sometimes the western coast is open until December. In 1892, on July 29, 30, and 31, between Jan Mayen and Ice Fiord, I did not see a single cake of ice. Thanks to these circumstances tourist-crowded liners in service before the war used to push up from the northwestern corner of Spitsbergen as far as the eightieth parallel to let their passengers enjoy a view of the polar pack. In no other part of the world can one reach so high a latitude in open water.

By contrast, a polar current flowing past eastern Spitsbergen, carrying a large amount of ice, blocks the eastern coast of Northeast Land, Barents Island, and Edge Island. Off the southern coast of the last-named island a branch of this current takes a westerly direction, rounds South Cape, and runs northward between the Gulf Stream and the western coast of Spitsbergen, carrying masses of ice which generally disappear by early summer.

Such is the normal state of the ice, but it may be interfered with by the winds. In spring and summer northern and eastern winds prevail,

* Special interest attaches to this article in view of the newspaper report from Paris that the Supreme Council of the peace conference on November 21 "approved the text of an agreement granting political suzerainty over the Spitsbergen archipelago to Norway."—EDIT. NOTE.

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the polar pack drifts southward and closes the generally open waters off the northern coast, whilst the eastern ice drifts southward also, opening Stor Fiord and the sea off the eastern coasts of Northeast Land, Barents Island, and Edge Island. A great deal of this ice skirts South Cape and arrives on the western coast at the southern point of Prince Charles Foreland. In 1915 so much eastern ice gathered on the western coast that Bell Sound and Ice Fiord were blocked and navigation was very difficult until

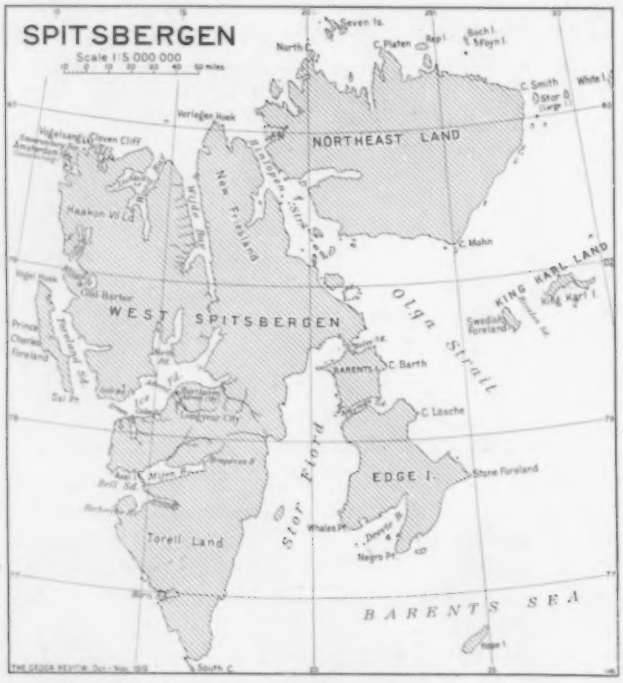

FIG. 1—Sketch map of Spitsbergen. Scale, 1:5,000,000.

the end of August. Probably not since the discovery of Spitsbergen, certainly not in the last fifty years, had the western coast been so obstructed by ice.

It also happens, but very rarely, that, owing perhaps to the greater flow of the Gulf Stream, the sea all about Spitsbergen remains open the greater part of the summer, and in such seasons the circumnavigation of the archipelago becomes possible. This was the case in 1918 and, before that, in 1886, 1887, 1898, and 1899.

History of Exploration

The story of the geographical exploration of Spitsbergen can be divided into three periods: (1) the Dutch-English, which lasted until the beginning

FIG. 2—Photograph of the map of the northwestern part of West Spitsbergen, 1:100,000, surveyed on Captain Gunnar Isachsen's expedition of 1906 under the auspices of the Prince of Monaco (see footnote 3). Reduced scale 1:790,000. Relief and glaciers are shown in contours and shading. A similar map, 1:200,000, with relief and glaciers in contours, has since been published by Captain Isachsen (see footnote 4). These maps are indicative of the recent scientific work done by the Norwegians in the interior of Spitsbergen, work which is still continuing.

of the eighteenth century; (2) the Norwegian-Swedish, between the end of the eighteenth century and the opening of the twentieth century; (3) the Norwegian, since 1906.

Dutch-English Period

The old Icelandic annals regarding the discovery of Spitsbergen by Norwegians in the eleventh century are vague, and the journey of Willem Barents in 1596 is considered as the first authenticated voyage to this Arctic land. The celebrated Dutch seaman visited only the western coast and a part of the northern coast of the main island, and the discovery of the other islands has been credited to English "adventurers" of the Muscovy Company. But this claim must be revised. The globe of the Dutch cosmographer Plancius, engraved in 1612 and newly discovered by Dr. F. C. Wieder, delineates the northern coast beyond Hinlopen Strait, the Seven Islands, the western and southern coasts of Edge Island, and Hope Island. Thus, previous to the English, even "before 1614, the entire circumference of Spitsbergen was known to the Dutch, except the vicinity of Heley Sound (Helis Sound) and the east coast of North-East Land and Edge Island, so that the Dutch may rightly be called the discoverers of the entire Spitsbergen group."[1]

About the middle of the seventeenth century, whilst the English whale fishery declined, the Dutch whaling industry had a rapid development, which was of great advantage to geography. Returning home, the Dutch whalers gave to the cosmographers of Amsterdam information concerning Spitsbergen, so that in Holland there was continuous and uninterrupted progress in the cartography of these polar islands. From 1594 to 1829, according to Dr. Wieder, more than two hundred maps of Spitsbergen were published in the Netherlands. To the Dutch we are indebted for the first cartographical documentation concerning these islands. During two and a half centuries the Dutch were the masters of the cartography of Spitsbergen.

Norwegian-Swedish Period

Toward the end of the eighteenth century the Dutch whale fishery declined, and the Norwegians arrived at Spitsbergen in order to hunt the walrus, seal, polar bear, and reindeer in summer. Their activity was at that time limited to the western coast and to the easily accessible part of the northern coast. In 1827 B. M. Keilhau, professor at the University of Christiania, chartered one of these sealing vessels and paid a short visit to Bear Island and Spitsbergen. This was one of the first scientific expeditions to these islands and one of the most successful. The geological, paleonto-

[1] The Dutch Discovery and Mapping of Spitsbergen (1596-1829). Edited by order of the Dutch Minister for Foreign Affairs by Dr. F. C. Wieder. Published by the Netherland Ministry for Foreign Affairs and the Royal Dutch Geographical Society, Amsterdam, 1919. [This splendid volume contains the reproduction of 83 maps of Spitsbergen between 1596 and 1829.]

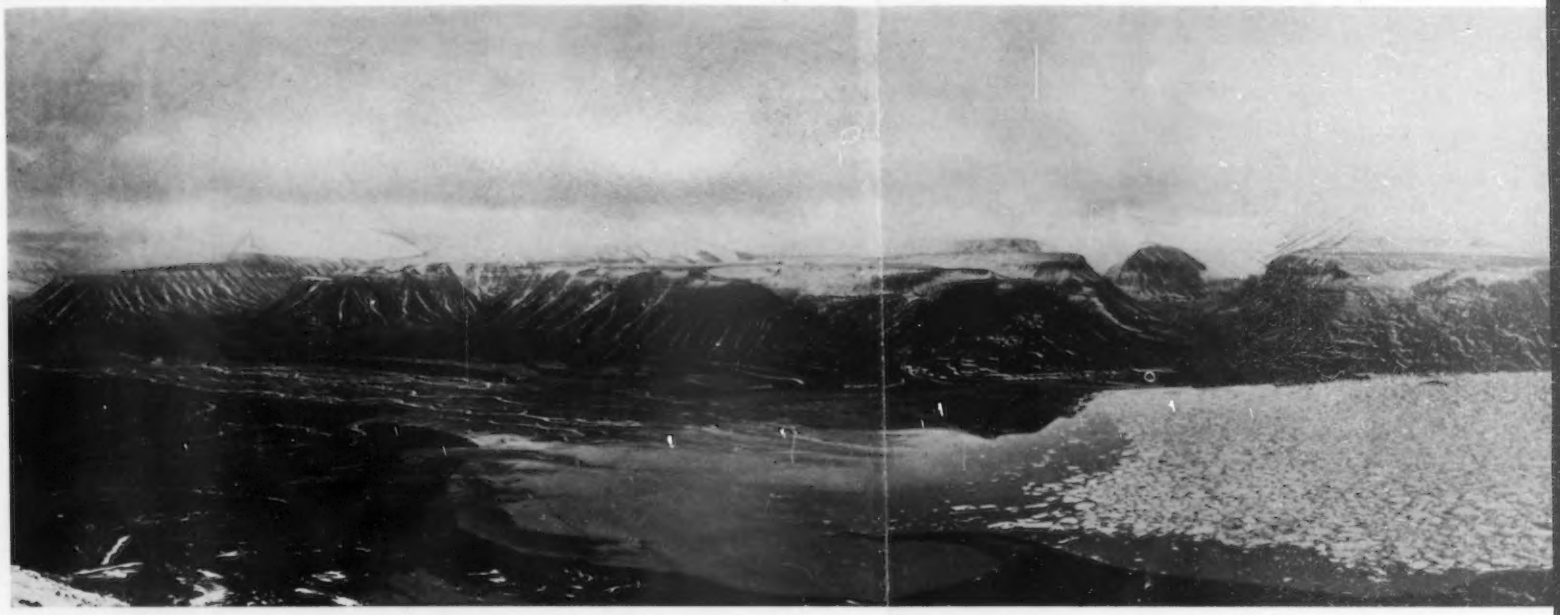

FIG. 3

FIG. 4

FIG. 3—Panorama of Advent Bay seen from the coal mine at Hiorthaven (formerly Advent City) on its northeastern shore. The panorama extends from southeast (left) to southwest (right) and sh
and the opening of the bay into Ice Fiord. The glaciated plateaus of the farther shore are typical of the whole peninsula between Ice Fiord and Bell Sound (see map, Fig. 1). On the western (rig
Engineer Alfred Koller.)

FIG. 4—General view of the coal mine at Longyear City. The mine lies on the western side of a small tributary valley entering Advent Bay from the south. The entrance to the mine can be seen hi
The houses at the foot of the slope are Longyear City (for close view of the harbor and Longyear City see Figs. 5 and 6). The mine was opened in 1905 by the Arctic Coal Company (Messrs. Ayer and Lo
The Norwegian colliery at Hiorthaven, formerly the British mining town of Advent City, lies on the opposite, northeastern, shore of Advent Bay, seen in the right background, near its mouth in Ice Fio

For locations in the Advent Bay region see the map of central Spitsbergen, 1:300,000, by Gerard de Geer, *Vmer*, Vol. 32, 1912, Pl. II

FIG. 3

FIG. 4

stern shore. The panorama extends from southeast (left) to southwest (right) and shows the delta of the river draining A
e peninsula between Ice Fiord and Bell Sound (see map, Fig. 1). On the western (right) slope of the prominent U-valley in

valley entering Advent Bay from the south. The entrance to the mine can be seen high up on the hillside to the left with
d 6). The mine was opened in 1905 by the Arctic Coal Company (Messrs. Ayer and Longyear) of Boston, Mass., but in 1915 v
neastern, shore of Advent Bay, seen in the right background, near its mouth in Ice Fiord. (Photo by Professor Adolf Hoel.)

Vol. 32, 1912, Pl. II

draining Advent Valley, the drift ice in the middle portion of the bay (note the steamer as scale). U-valley in the center lies the coal mine at Longyear City, shown in the figure below. (Photo by

e left with a cableway leading from it down to the harbor on Advent Bay in the center of the view. out in 1915 was sold to the Great Norwegian Spitsbergen Coal Company, a Norwegian syndicate. dolf Hoel.)

logical, and botanical studies which Keilhau had the opportunity of making during his voyage are fundamental. In 1837 the Swedish professor S. L. Lovén also made a scientific trip to the western coast in a Norwegian vessel.

In 1858 the second chapter of the history of Spitsbergen opens with the geographical exploration of the archipelago both by Swedish scientific expeditions and by Norwegian walrus hunters. From 1858 to 1908 twenty Swedish expeditions went to Spitsbergen under the leadership of scientists like Otto Torell, A. E. Nordenskiöld, A. G. Nathorst, Baron Gerard de Geer, and others. Besides valuable scientific studies they published in 1865 the first chart of the archipelago based on surveys. This chart has been the basis for later ones representing fresh discoveries. The British Admiralty's chart, for example, reproduces the results of the Swedish surveys.

Discoveries by Norwegian Walrus Hunters

During the second half of the nineteenth century no Norwegian scientist took part in the exploration of Spitsbergen. Nevertheless important discoveries were made by Norwegians. About the year 1850 game became scarce in the easily accessible parts of Spitsbergen, and Norwegian walrus hunters sought new grounds in the generally ice-blocked waters stretching northward and eastward and made important discoveries in the hitherto unknown eastern parts of Spitsbergen.[2]

The first step in this direction was taken in 1847 when Captain Lund navigated Thymen Sound, between Edge Island and Barents Island, for the first time. At that time Barents Island was not known to be an island; it was represented as a large foreland of West Spitsbergen, and Heley Sound was shown as a fiord. In 1858 Captain Johan Nilsen crossed this inlet from sea to sea, demonstrating the supposed fiord to be a strait. By this discovery the features of eastern Spitsbergen were also completely changed. In 1859 another Norwegian seal hunter, the well-known Elling Carlsen, cruising eastward of Edge and Barents Islands, found himself near an unknown land. This was the islands now named King Karl Land but then identified with Giles Land, an island seen in 1707 by Commander Giles, the position of which remained uncertain at this date. Three years later, in 1861, Carlsen for the first time circumnavigated the whole archipelago—a splendid achievement. During this cruise the true nature of Northeast Land was ascertained. It was discovered that the eastern coast of this large island is entirely occupied by a great glacier discharging into the sea and forming the eastern outflow of an inland-ice mass which covers the whole island. In 1864, off the eastern coast of Northeast Land, another gallant Norwegian hunter, Tobiesen, rediscovered Stor Ö (Large Island), seen by Dutch whalers in the seventeenth century.

[2] The survey of the Norwegian exploration of Spitsbergen here given summarizes a statement compiled by order of the Norwegian Government by Adolf Hoel, of the University of Christiania, the leading Norwegian explorer of these islands in recent years.

In 1867, Rönnback circumnavigated West Spitsbergen and discovered a group of small islands on the western coast of Hinlopen Strait in 79° N.

In 1871, an English sportsman, B. Leigh Smith, chartered a Norwegian schooner under the command of Captain Ulve, an expert Norwegian ice navigator. Reaching the southern and later the northern coast of Northeast Land, they stated that this land stretched about 43 nautical miles farther eastward than was formerly believed.

In the following year knowledge of eastern Spitsbergen was advanced by Norwegian seal hunters. Taking advantage of an open season, Altman, Johnsen, and Nielsen reached King Karl Land and reported that there were several large and small islands divided into two groups by a large sound. Johnsen landed on the northeastern point of the eastern group.

In 1876 and 1887, eastward of the northeastern point of Northeast Land, two Norwegian walrus hunters, Kjeldsen and E. H. Johannesen, came in sight of an unknown island, White Island, the true Giles Land. In 1889, another Norwegian walrus hunter, Hemming Andreassen, completed our knowledge concerning King Karl Land by navigating the northern part of the sound dividing the two main islands, Svenska Förland (Swedish Foreland) and King Karl Island. This sound was called Rivalen Sound from the name of Andreassen's ship. According to Professor Nathorst, the sketch map of this Norwegian walrus hunter was not superseded until the survey of this group of islands was made by the Swedish expedition of 1898; it is, however, much more accurate than the map that Dr. W. Kükenthal, the well-known zoölogist of Jena, published after visiting King Karl Land in a Norwegian hunting sloop that same summer. So strong is respect for established authority in old Europe that in a new issue of their maps of Spitsbergen the British and French hydrographic offices reproduced the incorrect sketch made by the German scientist rather than the accurate one by the Norwegian skipper.

Finally, in 1898, Norwegian hunters, starting from the northeastern corner of Northeast Land, discovered beyond White Island a new island, which they named Victoria Island. These seamen also reported that Spitsbergen and Franz Josef Land have a fringe of islands between them. These two polar lands form a dam which prevents the polar pack from flowing southward in great masses. To this circumstance northern Europe is indebted, in part, for its relatively mild climate.

To summarize, we may say that in eastern Spitsbergen the Norwegian walrus hunters did admirable pioneer work, opening the way for further scientific expeditions. Also, geography is indebted to them for determining the directions of ice drift around Spitsbergen.

In order to complete the description of the contributions to our knowledge of Spitsbergen made by Norwegian hunters, it must be added that, of the trappers who have been wintering in the islands since the last years of the nineteenth century to catch bear and fox, eighteen parties made

FIG. 5

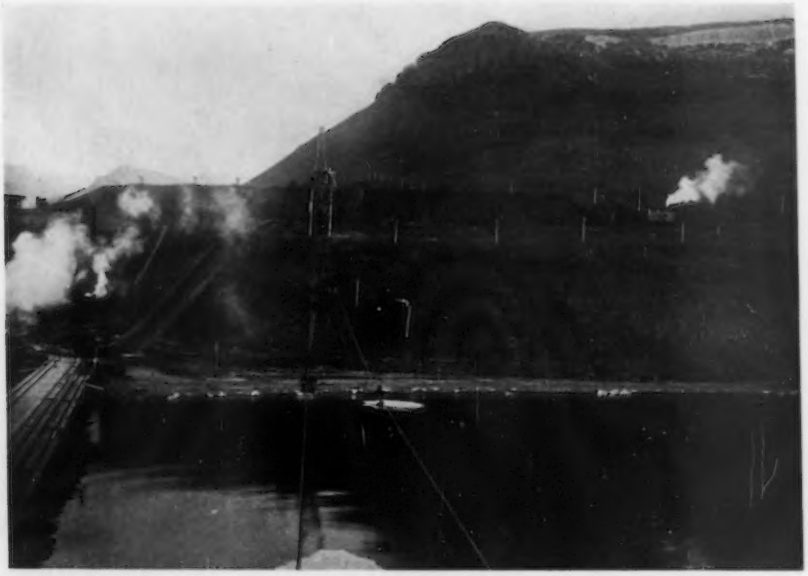

FIG. 6

FIG. 5—Longyear City in summer.

FIG. 6—The wharf and cableway on Advent Bay for unloading coal from the mine at Longyear City.

regular meteorological observations, both on the western and the eastern islands, with instruments lent by the Meteorological Institute of Christiania, and thus added substantially to our knowledge of the climatology of this Arctic land.

Recent Norwegian Scientific Exploration in the Interior

In 1906 the last chapter in the exploration of Spitsbergen was begun by Norwegian scientists, using new methods of exploration. Until then few expeditions had been undertaken in the interior, so that practically the whole inland portion of the islands remained a *terra incognita*. In 1906, the Prince of Monaco, having taken Spitsbergen waters as a field for oceanographical research, began the systematic survey of the western island. Establishing his headquarters in Cross Bay, he entrusted the mapping of the mountainous massifs stretching from that bay to Smeerenburg Bay to Captain Gunnar Isachsen of the Norwegian army, who had been the topographer of Sverdrup's expedition to the American Arctic Archipelago. With a staff of Norwegian surveyors and naturalists and with Dr. Louet of the French army, Captain Isachsen admirably fulfilled his task in two summers.

The results are of great value.[3] About 200 square miles of Spitsbergen's ice world were mapped by accurate methods on the scale of 1:100,000 with contours of elevation. Never before had such a great area of the interior of Spitsbergen been surveyed, nor an Arctic land mapped so accurately. This successful expedition aroused in Norway a still greater interest in this region. The Norwegian parliament and private citizens granted large subsidies for pursuing the work initiated by Isachsen. Henceforward the foundations were laid for a systematic survey of the western fiord region of West Spitsbergen, and every summer thereafter one or two Norwegian expeditions went to this island.

In 1907 and 1910 a large expedition set off under the command of Captain Isachsen, numbering, besides the leader of the expedition, nine scientists. Extending in all directions the survey made on behalf of the Prince of Monaco, they brought back maps of northwestern Spitsbergen between the northern coast, Wijde Bay, and Ice Fiord, of the region adjoining Green Harbor in the last-named fiord, and of Prince Charles Foreland.[4] During the two summers in which the expedition was in the

[3] The scientific results of the expedition are laid down in the splendid series of monographs published by the Prince of Monaco under the title "Résultats des campagnes scientifiques accomplies sur son yacht par Albert Ier, Prince souverain de Monaco," Fascicules 40 (surveys; with the map, 1:100,000, showing relief and glaciers in contours and shading, reproduced in Fig. 2 of the present article), 41 (glaciology), 42 (geology and physiography), 43 (geology), 44 (botany).

[4] The geographical results are contained in:

Gunnar Isachsen: Travaux topographiques de l'expédition Isachsen, 1909-1910, *Kristiania Videnskaps-selskapets Skrifter: I. Mat.-naturv. Klasse*, 1915, No. 7 (=pp. 1-63). [Contains the map of northwestern Spitsbergen in 1:200,000, showing relief and glaciers in contours.]

Idem: Green Harbour, *Norske Geogr. Selskaps Aarbok*, 1912-13, pp. 151-162. [With a map of Green Harbor in 1:100,000.]

FIG. 7

FIG. 8

FIG. 7—Traveling over the ice field toward the Three Crowns, the three summits seen in the left background, east of Kings Bay (western coast of West Spitsbergen, 79° N). (Photo by Captain Gunnar Isachsen, expedition of 1909-1910.)

FIG. 8—Winter hut of Norwegian trappers at Safe Harbor, northern shore of Ice Fiord. (Photo by Dr. Holtedahl, 1909.)

field more than 2,000 square miles were mapped, and a great quantity of geological data was gathered.

From 1911 to 1918, under the leadership of Adolf Hoel and Captains Arve Staxrud and Sverre Rövig, topographical and geological surveys were extended to the peninsula between Ice Fiord and Bell Sound and southward to the coastal region as far as Horn Sound. The work of the Norwegians in Spitsbergen from 1906 until 1918 may therefore be summarized as follows:

All the western coastal region as far as a point lying three statute miles south of Horn Sound is now accurately triangulated and mapped in detail.[5] That is a piece of land about 200 statute miles long and 18 to 58 miles wide, covering 5,600 square miles. For the northern sheets the scale of 1:200,000 has been adopted, and for the southern sheets 1:100,000 and 1:50,000. All these maps will soon be published; a chart of the western coast of Spitsbergen, more nearly correct and more complete than the British and German charts, has already been published by the Norwegian Hydrographic Office.[6] In the coming years the survey will be continued southward; it is hoped to reach South Cape by 1922.

These expeditions also attained geological results of exceptional value. The chief points of interest about these researches are the study of the Devonian on the northern shores, the discovery of Quaternary volcanoes and of hot springs on the western shore of Wood Bay,[7] and the true determination of the age of the massifs of crystalline schists in the northwestern corner. These schists, ascribed to Archean, belong to the upper Hecla Hoek series (Silurian).

Besides these systematic expeditions, there were several others equally successful.

In 1908, Mrs. Hanna Resvoll-Holmsen made a botanical survey of the fiord region in West Spitsbergen. The same year and again in 1912 her husband, Dr. Gunnar Holmsen, carefully studied the numerous strata of fossil ice[8] whose existence in the soil of Spitsbergen was discovered in 1892 by the author of this paper.

Glacial Features of West Spitsbergen

Thanks to the Norwegian expeditions, the peculiar glacial phenomena of West Spitsbergen can now be outlined. In the northwestern corner there

[5] Besides the Norwegian surveys there should be mentioned the map of Prince Charles Foreland, 1:140,000, by Dr. W. S. Bruce and M. J. Mathieson, published in 1913 by the Scottish Oceanographical Laboratory of Edinburgh with the support of the Prince of Monaco.

[6] Spitsbergen: Farvand og Ankerpladser paa Vest- og Nordkysten, 1:200,000, with seven insets, Norges Geografiske Opmaaling Chart No. 198, Christiania, first edition, 1912.

[7] A. Hoel and O. Holtedahl: Les nappes de lave, les volcans et les sources thermales dans les environs de la baie Wood au Spitsberg, *Kristiania Videnskapsselskapets Skrifter: I. Mat.-naturv. Klasse*, 1911, No. 8 (=pp. 1-37).

Adolf Hoel: Nouvelles observations sur le district volcanique du Spitsberg du nord, *ibid.*, 1914, No. 9 (=pp. 1-33).

[8] Gunnar Holmsen: Spitsbergens jordbundis og de bidrag dens undersøkelse har kunnet gi til forstaaelsen av de i arktiske land optraedende varige isleier i jorden, *Norske Geogr. Selskaps Aarbok*, 1912-13, Christiania, pp. 1-132, with summary in German, pp. 133-150.

is no ice sheet. The former inland ice, which had totally covered the region, has shrunk, and now alpine crests rise above the ice to heights of 4,200 feet and delineate great ice streams. But eastward from a line joining Cross Bay with the head of Wood Bay the alpine crests merge into ice-covered plateaus. As reckoned by Isachsen, the glaciated area in the coastal region extending from Smeerenburg Bay and Liefde Bay to Cross Bay is 67 per cent of the total area. On the other hand, the great peninsula between Ice Fiord and Bell Sound with large plateau massifs divided by wide valleys bears no arctic character. In that part of Spitsbergen the

FIG. 9—The Mälar Valley looking down (southwest) to its junction with Advent Valley. The plateau on the far side of Advent Valley is the same as that seen on the left in Fig. 3. (Photo by Engineer Koller, 1917.)

glaciation is only local. The large valleys are bare in summer and have boggy soils and meager pastures. Forty years ago numerous herds of reindeer were to be found there in autumn. Southward from Bell Sound and around Horn Sound there is a rugged land with large coalescing glaciers issuing from an ice sheet occupying the interior back of the high coastal crests.

THE SURROUNDING SEAS

The Norwegians have explored not only Spitsbergen, but also the surrounding seas. The first undertaking of this nature was the classic Norwegian deep-sea expedition headed by Mohn, Sars, and Danielssen which explored the Arctic Ocean from Iceland to Jan Mayen, Bear Island, and Spitsbergen (1876-1878). Later on, in 1900, Hjort and Nansen carried out a very valuable oceanographic cruise in the Arctic Ocean as far as Bear Island. In 1901, before starting on his Northwest Passage expedition, Roald Amundsen, on his celebrated *Gjöa*, investigated the oceano-

FIG. 10—Kings Bay from Coal Harbor, the mining settlement of the Norwegian Kings Bay Coal Company on its southern shore. On the right is shown the terminus of the most northerly railroad in the world (78° 56' N.). The line, 1½ miles long and of 36-inch gage, carries the coal from the mine to the harbor.

graphic conditions around Spitsbergen.[9] During Isachsen's expedition in 1909 a great many vertical series of deep-sea observations were made.[10] Finally, in 1912, on his small yacht, Nansen investigated the waters of the western and northern coasts of Spitsbergen.[11]

The foregoing summary demonstrates the fundamental nature of the work the Norwegians have done in Spitsbergen. No other nation compares with them in their geographical discoveries, the number and accuracy of their surveys, and the extent of their scientific results in this archipelago.

Industrial Development

COLLIERIES

With the twentieth century a new era begins in the history of Spitsbergen. Until then the archipelago had remained uninhabited, but during the past few years it has become a mining land and attracted a considerable number of Norwegian settlers. Coal deposits were long known to exist on

[9] Fridtjof Nansen: Northern Waters: Captain Roald Amundsen's Oceanographic Observations in the Arctic Seas in 1901, *Kristiania Videnskapselskapets Skrifter: I. Mat.-naturv. Klasse*, 1906 No. 3 (=pp. 1-145).

Björn Helland-Hansen and Fridtjof Nansen: The Norwegian Sea: Its Physical Oceanography Based upon the Norwegian Researches 1900-1904 (Reports on Norwegian Fishery and Marine Investigations, Christiania, 1909, Vol. 2, No. 2). [A standard work.]

[10] Björn Helland-Hansen and Fridtjof Nansen: The Sea West of Spitsbergen: The Oceanographic Observations of the Isachsen Spitsbergen Expedition in 1910, *Kristiania Videnskapsselskapets Skrifter: I. Mat.-naturv. Klasse*, 1912, No. 12 (=pp. 1-89).

[11] Fridtjof Nansen: Spitsbergen Waters: Oceanographic Observations during the Cruise of the "Veslemöy" to Spitsbergen in 1912, *Kristiania Videnskapsselskapets Skrifter: I. Mat.-naturv. Klasse* 1915, No. 2 (=pp. 1-132).

the shores of Ice Fiord, but not until the first years of this century were they worked.

At present the best-developed collieries in Spitsbergen belong to Norwegian companies.

The Great Norwegian Spitsbergen Coal Company is working the most productive coal seams on the island on the western side of Advent Bay, which it bought in 1915 from the Arctic Coal Company of Boston, Mass.[12] From 1909 to 1915 the total exportation of coal by the Boston company amounted to 150,000 tons. In the three following years it amounted to 85,000 tons.[13] This year (1919) the Norwegian company was also to start the exploitation of another coal deposit at Green Harbor.

The Norwegian Kings Bay Coal Company is working on the south shore of Kings Bay.

There are in addition four other Norwegian coal companies now beginning development. One has bought the holdings of an English company on the northeastern side of Advent Bay and will resume work this year. The capital invested in the six Norwegian collieries amounts to $4,200,000.

After the Norwegians come the Swedish Spitsbergen Coal Company, working on both sides of Braganza Bay (Bell Sound), and a Russian company working between Green Harbor and Coles Bay under the management of a Norwegian engineer.

The British are far behind, with two companies: the Scottish Spitsbergen Syndicate, headed by Dr. W. S. Bruce, and the Northern Exploration Company. Several years ago Dr. Bruce did some mining work on coal seams on Prince Charles Foreland, but nothing further seems to have come of it. The Northern Exploration Company has quarried a conglomerate which was taken for marble on the north shore of Kings Bay. This stone is said to be of little value, and it is asserted that none has been exported. The same company also claims an iron-ore deposit in Recherche Bay (Bell Sound) which is emphatically proclaimed to be one of the richest of the world. Scandinavian geologists who have studied this deposit are not of the same opinion. The Northern Exploration Company has recently undertaken preparatory work for mining coal on an island in Bell Sound.

The table, on page 223, of coal exportation and of the number of workmen at each mine summarizes the activity of the different nations in Spitsbergen in 1918.

Settlements and Population

Advent Bay is the chief population center of Spitsbergen. On its western side lies Longyear City, the most important settlement of the archipelago, and now belonging to the Great Norwegian Spitsbergen Coal

[12] Cf. *Geogr. Rev.*, Vol. 7, 1919, p. 318.

[13] All the statistical data concerning the present economic status of Spitsbergen are taken from an official statement prepared by the Norwegian Government which will be issued several months hence.

FIG. 11

FIG. 12

FIG. 11—Looking south down Erdmann Glacier (right and center foreground) and its outlet valley to the further shore of Bell Sound (in the background). The massif on the right is Mt. Conway, that on the left, South Halland Ridge. (Photo by Engineer Koller.)

FIG. 12—"Glacier flooding" south of Horn Sound: view taken from a 933-meter summit. (Photo by Solheim, 1918.)

Company. It offers very good accommodations, comfortable houses, electric light—the last very necessary indeed during the four months of long polar night. There are also a telephone system, well-stocked stores, and a hospital attended by a physician. In the summer of 1918 Longyear City

TABLE I—EXPORT OF COAL FROM SPITSBERGEN

COMPANY	EXPORT IN 1918 (TONS)	NUMBER OF WORKERS	
		SUMMER 1918	WINTER 1918-1919
Great Norwegian Spitsbergen Coal Company	40,000	320	300
Norwegian Kings Bay Coal Company	15,000	300	164
Norwegian Colliery Spitsbergen Company (northeastern side of Advent Bay)	0	100	60
Swedish Spitsbergen Coal Company	4,000	80	?
Russian company under Norwegian management	2,500	40	?
Northern Exploration Company	0	50	?

numbered 300 inhabitants, all Norwegians. On the opposite side of the bay there is another Norwegian settlement, Hiorthaven.[14] Its population, entirely Norwegian, does not exceed 100 souls in summer and 60 in winter.

Besides these there are, on the southern shores of Ice Fiord, two small Norwegian hamlets, one on land owned by the Russian company between Coles Bay and Green Harbor, and another in Ice Fiord, near the coal deposits belonging to the Great Norwegian Spitsbergen Coal Company. On the southern shore of Kings Bay a large Norwegian settlement has been built near the Norwegian colliery, and on an island of the same fiord are some houses belonging to the Northern Exploration Company. In Bell Sound, besides small Norwegian hamlets on both sides of the fiord, there are in Braganza Bay a Swedish village near the Swedish mine and a British settlement on Axel Island.

During the past summer the Norwegian population of Spitsbergen amounted to about 800 souls.

COMMERCE AND COMMUNICATIONS

Among Spitsbergen shipping the Norwegian flag takes first rank:

TABLE II—NORWEGIAN SHIPPING TO AND FROM SPITSBERGEN

	ARRIVALS AT SPITSBERGEN FROM NORWEGIAN HARBORS		ARRIVALS IN NORWEGIAN HARBORS FROM SPITSBERGEN	
	SHIPS	NET TONNAGE	SHIPS	NET TONNAGE
1904	..	.....	3	2,347
1907	50	13,093	42	10,256
1914	27	15,986	33	17,904
1916	12	6,819	17	7,867
1917*	57	11,927	40	10,725

* The last statistics available.

Since Mr. Longyear sold his settlement to a Norwegian company, the other flags are represented only by a few units.

[14] It takes the place of the former English mining settlement of Advent City, which no longer exists.

In 1917 the general commerce between Norway and Spitsbergen attained its highest figure up to that time, $1,240,000; in 1918 it was probably much higher, owing to the increase of coal exports.

At Green Harbor the Norwegian Department of Telegraphs has erected a powerful wireless station communicating with a station at Ingö, near the North Cape of Norway, and at the Norwegian settlements of Longyear City and of Kings Bay and at the Swedish settlement in Braganza Bay secondary wireless stations are installed. A Norwegian postal service is established between Norway and Spitsbergen, with three post-offices, at Longyear City, Green Harbor, and Kings Bay. In 1918, from June to October, postal steamers made 26 voyages.[15] At the wireless station at Green Harbor a complete meteorological station is working whose observations are published in the *Jahrbuch des Norwegischen Meteorologischen Instituts.*

Bear Island

A Norwegian company has also occupied Bear Island (Beeren Eiland). Lying 108 nautical miles southwards from the South Cape of Spitsbergen, this island is not so cold as Spitsbergen. Its annual temperature is —4.3° C. instead of —9.7° C. at Green Harbor,[16] but the East Spitsbergen polar current, flowing westward, carries extensive drift ice all around the island. When the season is good, Bear Island is entirely ice-free for at least four months; in bad years the sea remains ice-strewn until July, but navigation is possible before that time.

At Bear Island coal occurs in the Devonian and Culm strata. Since 1916 the building of a settlement and installations for the working of coal deposits have been under way; so far the exports have been small. Eighty men wintered this year on the spot.

Predominance of Norwegians in Spitsbergen Navigation

The Norwegians have also had the largest share in the industrial development of Spitsbergen. Besides this, their acquaintance with the ice conditions for more than a century has, in a way, given them the monopoly of navigation in this archipelago, and nearly all the expeditions that have visited this Arctic land have engaged Norwegians as ice masters, frequently

[15] During the fiscal year 1917-1918 the Green Harbor station received 2,041 telegrams and dispatched 3,323. It has intercepted 3,317 telegrams from other European and from American stations. In 1918, 10,322 letters, newspapers, and parcels were sent from Norway to Spitsbergen and 5,649 from Spitsbergen to Norway.

[16] Only three years of observations at Bear Island (1865-1866, 1910-1911, 1916-1917), seven years at Green Harbor:

Monthly Mean Temperature (C.) at Bear Island and at Green Harbor*

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bear Island	−10°.5	−12°	−11°.2	−8°.7	−3°.6	+2°	+4°.2	+4°.5	+1°.5	−2°.3	−6°.4	−8°.6
Green Harbor	−20°.8	−22°.9	−21°.5	−14°.7	−6°.8	+1°.3	+4°.4	+3°.9	−0°.7	−6°.8	−14°.3	−17°.2

* Based on Adolf Hoel, A. Kvalheim, Claus Schive, med bidrag af Gabriel Smith: Björnöya, Christiania, 1918. [Published for private circulation only.]

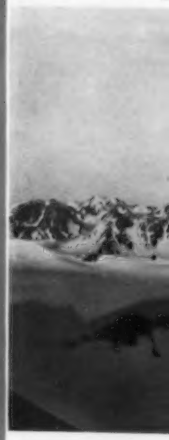

Fig. 13—Panora
which ends in Red
Fig. 14—Panora
Fig. 15—Bürger

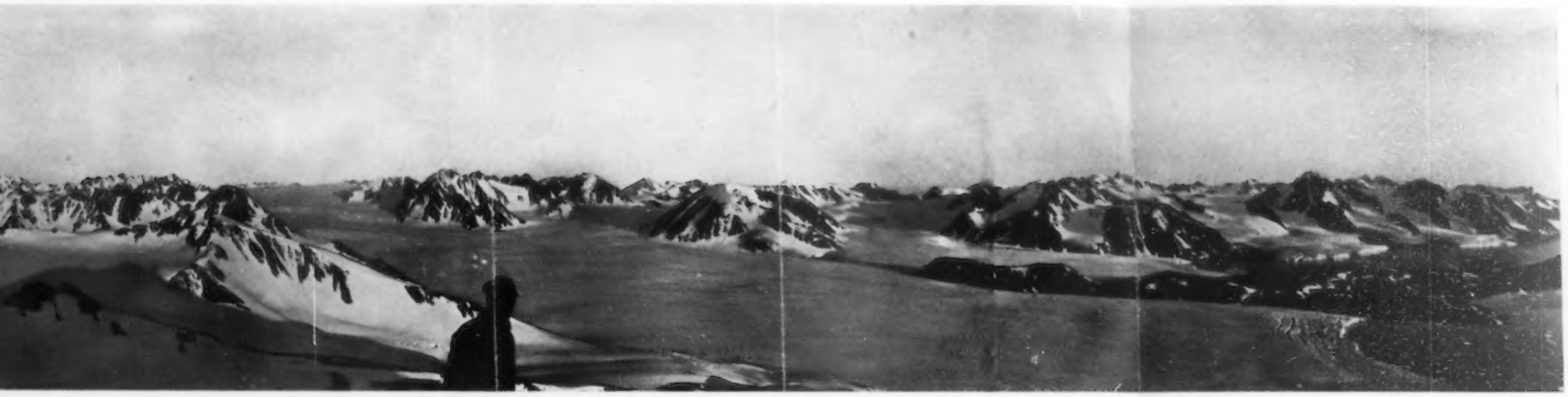

FIG. 13

FIG. 14

FIG. 15

13—Panorama from Ben Nevis, a summit 913 meters high southeast of Red Bay, northern West Spitsbergen. The view, which extends from south to northwest, shows practically the whole extent of the Grand Glacier, nds in Red Bay (on the right). For locations see map referred to in footnote 4, first item. (Photo by Captain Gunnar Isachsen, August 14, 1909.)

14—Panorama of Horn Sound, southern West Spitsbergen, taken from the ridge between Bürger Bay and Adria Bay. (Photo by Professor Adolph Hoel, 1918.)

15—Bürger Bay, Horn Sound. The ice is calved ice from the debouching glaciers. (Photo by Professor Hoel.)

even entirely Norwegian crews. Thus, if the Norwegian Government should forbid its nationals to pilot foreign ships to Spitsbergen, nearly all maritime traffic between these islands and other lands than Norway would cease or become very dangerous.

Political History

Ancient Claims and Disputes

Spitsbergen is not a "*terra nullius*," as it has been asserted. History establishes its rightful position.

At the end of the seventeenth century and for a long time afterwards Greenland was supposed to stretch northeastward and rejoin northern Russia by way of the Arctic Ocean. Barents himself and all his contemporaries were of the opinion that the land which he had discovered was part of a group of islands off the eastern coast of Greenland, and in this belief Spitsbergen was generally named Greenland until the beginning of the nineteenth century. Greenland belonging to the then united Norwegian and Danish crown, the King of Norway and Denmark accordingly claimed the ownership of Spitsbergen. This claim was also based on his generally accepted overlordship of the Arctic Ocean north and west of Europe, consequently of all the islands it contains wherever they might be and by whomsoever discovered.

In 1610 a number of whales in the western fiords of Spitsbergen having been seen by Jonas Poole, the news spread rapidly, and soon after numerous British, Dutch, French, Danish, and Hanseatic whalers arrived at Spitsbergen. Among all these competitors troubles and disputes arose; even sea fights were not infrequent. The King of Norway and Denmark, Christian IV, protested against these incursions of his domain, and long diplomatic negotiations on the whale fishery and on the overlordship of Spitsbergen opened between the Norwegian-Danish monarch and the King of England, the States General of the Netherlands, the King of France, the Hanseatic cities, and the King of Sweden. These polar islands were the occasion of the first colonial conflict among European nations.

Norwegian Claims

The King of England, James I, never expressly acknowledged the claim of Norway-Denmark regarding the sovereignty of Spitsbergen. Nevertheless in 1614 he offered to pay a rent to the Danish King, provided that English subjects should be granted a monopoly of the whale fishery in these islands together with the Norwegians and the Danes. Later on he suggested to Christian IV that he should sell him his right to "Greenland," that is Spitsbergen. The diplomatic transactions with England ended in 1621 by an agreement giving equal rights to English and Norwegian-Danish whalers in Spitsbergen. On the other hand, in 1632 the overlordship of

the King of Norway and Denmark was accepted by the States General; however, a century later, in 1741, this acceptance was questioned by the Dutch. In 1663, 1679, and 1692, France, Sweden, and the Hanseatic cities respectively recognized the sovereignty of the King of Norway and Denmark over these polar lands.

Why has Spitsbergen today been declared *terra nullius?* During the second part of the seventeenth century, whales having deserted the coastal waters of Spitsbergen, there was a cessation of the disputes regarding these islands. When two centuries later, in 1872, Spitsbergen again found a place in the minds of diplomats, the old transactions were totally forgotten, and the archipelago was proclaimed *terra nullius.* Only recently, in 1912, Dr. Arnold Raestad revived a knowledge of their history, basing his information on the state papers of Great Britain, Denmark, the Netherlands, and France.[17] Is there no such thing in regard to treaties as title by long possession? By inheritance of the Danish king's rights Norway possesses the sovereignty of the archipelago, but this sovereignty is not complete, not having been recognized by all the powers.

[17] Arnold Raestad: Le Spitsberg dans l'histoire diplomatique (translated from the Norwegian by Charles Rabot), *La Géographie*, Vol. 25, 1912, pp. 335-354; Vol. 26, 1912, pp. 65-98. The Norwegian original, "Norges hoihetsret over Spitsbergen i aeldre tid," Christiania, 1912, contains 47 original documents.

GEOGRAPHY AS AN AID TO STATECRAFT

AN APPRECIATION OF MACKINDER'S "DEMOCRATIC IDEALS AND REALITY"*

By FREDERICK J. TEGGART
University of California

New ideas are never wholly welcome guests. We are all creatures of habit and shirk the discomfort of entertaining strangers whose language we do not quite understand. Ordinarily we prefer the modes of thought in which we have been brought up. Only in times of trouble and upheaval, when the familiar routine of our lives is broken into, are we really open to new suggestions. But at such times we become alarmed and clamor nervously for the prompt application of practical expedients. In emergencies men are impatient to act, "to do something," without undue consideration. In such circumstances men think new methods are likely to prove a waste of time. Yet this is just one of the great lessons of the war. To overcome difficulties, and to succeed, it is necessary to be on the alert for new ways of doing things; and it is necessary to try these new ways, even in face of a nearly victorious enemy.

NEED OF SCIENTIFIC METHOD IN THE STUDY OF HUMAN AFFAIRS

Mr. Mackinder, ex-director of the London School of Economics and Member of Parliament, proposes a new method for approaching political questions, and his views demand serious attention. Today, he says, all society is clay in our hands. We are trying to remold this clay with the aim of producing a new and more equitable ordering of the affairs of men. But, he insists, the vision of a beautiful object—whether a Grecian urn or a league of nations—is not all that the clay-molder requires. He must have technical knowledge. Today we know how to manufacture munitions; we do not know how to assist Russia in setting up a stable régime. We know how to build airplanes and submarines; we do not know how to meet the demands of labor and capital. In the present situation expedients will no longer serve our needs. We cannot restore the conditions that existed before the war. We cannot accept all the proposals that are being put forward. Yet we must go on. The clay must be reshaped. To do this, without inviting disaster, we must have knowledge; and we must acquire this knowledge, not in academic seclusion, but as we go.

What we need, and need urgently, is the application of scientific method to the problems of human relations. Mr. Mackinder is emphatic in saying

* H. J. Mackinder: Democratic Ideals and Reality: A Study in the Politics of Reconstruction. Henry Holt & Co., New York, 1919.

that we cannot hope to safeguard our democratic ideals without a grasp of the realities of geography and economics. He himself, in this book, attempts to put science to work in the field of politics; he seeks to yoke learning to the plow of public service. It is true that he is not alone in this desire to have our political experimentation conducted in accordance with scientific principles. He stands out, however, as one who has the courage to enlist erudition as a guide to action.

This is not the first time that men have endeavored to approach human problems in a scientific spirit. We have, of course, forgotten the effect of the Revolutionary and Napoleonic wars on Mr. Mackinder's predecessors. We have, for example, forgotten that it was the aim of Malthus "to investigate the causes that have hitherto impeded the progress of mankind towards happiness, and to examine the probability of the total or partial removal of these causes in future." Malthus was far from being a voice crying in the wilderness; he was a participant in a movement, unhappily premature, to apply the comparative method to the investigation of social difficulties. So, too, the realization of the unity of the Eurasian continent, which Mr. Mackinder considers a revolution in the thought of our time, is not new. Even his remarkable presentation is no finer demonstration of this unity than the "Tableaux historiques de l'Asie" which Julius Klaproth published in 1826.

It is essential that we should recall instances like these in order to realize the precariousness of intellectual advance. The eighteenth century initiated scientific inquiry into the phenomena of human activity. Had this aim been fostered we should not be groping in the darkness of today. As it turned out, the efforts of Englishmen and Frenchmen to reach a new basis of inquiry were set aside in favor of a return to conventionalized scholarship under Prussian leadership.

The new movement which Mr. Mackinder represents cannot achieve its aim without definite and purposive support. This support, to be continuous, must be developed through the instrumentality of the university. But in what immediate connection can this be effected?

Failure of History to Meet This Need

One might think that history would have taken the lead in the application of scientific method to humanistic study. The comparative method lends itself effectively to the study of institutions; and one would expect a world outlook in the study fathered by Herodotus. History, however, has not embraced the opportunity. For this failure there are obvious reasons. In the first place, humanistic study has never progressed far beyond the Renaissance activity (on a par with that of the Alexandrian librarians) of editing texts for publication, and history, in the nineteenth century, surrendered unconditionally to this tradition. Then again the outlook of the historian is narrowed by the materials with which he works, and his

vision is restricted to the contents of documents written in languages he can understand. As a result the study of history has persistently maintained a Europocentric standpoint. It is only within a few years that the extension of "ancient history" to include Egypt and Mesopotamia has been accepted in university teaching, and, as yet, Farther Asia is wholly ignored. The study of history is carried on in narrow compartments of periods and countries. This rigid procedure renders impossible the comparison of human experience under different conditions, and without comparison scientific results cannot be attained.

Opportunity of Geography

History being thus tied down by its traditions, we are forced to look elsewhere for a foundation on which to base a scientific study of man. Fortunately geography is available, and it has striking advantages for the purpose. It is unhampered by limiting traditions. It has not hitherto been taught in the university and is therefore open to free development in response to needs. It has the great advantage of close affiliation with the developed science of geology and may be said to be on good terms with anthropology, archeology, and economics. By the force of its materials, it is committed to a world outlook. The historian having put aside the leadership of Herodotus to follow the precedent of Thucydides, it is now possible for the geographer to return to the older and wider vision. Mr. Mackinder has taken the initiative in showing how a knowledge of geography may be utilized in dealing with the practical problems of political life.

To Make the World Safe—

We propose to make the world safe for democracy—but how is this to be done? Not by setting up a league of nations based upon juridical conceptions and diplomatic compromises. International law failed wholly to avert the war. Law comes into play when wrongs have been committed; but it is helpless without the backing of force. It prescribes limitations; but an uncounted number of law-making and law-administering bodies is required to keep up with men's ingenuity in finding loopholes of escape. "In our great replanning of human society we must recognize that the skill and opportunity of the robber are prior facts to the law of robbery." So we must take up our problems today as men dealing with realities of growth and opportunity, not merely as lawyers defining rights and remedies.

Democracies are inspired by ideas, not ruled by force. At great moments men become conscious of vast ideals: ideals of liberty in 1789; of nationality in 1848; of world unity in 1917. Is tragedy also to follow in the wake of this latest vision? Is the disappointed idealist again to fall into the hands of a Napoleon or a Bismarck? The nemesis of democratic

idealism is the rule of the organizer. Democracy aspires to enable every individual to live a full and self-respecting life; the organizer disciplines men in the interest of efficiency. The democrat thinks in terms of principles, the organizer plans constructions. He opposes strategy to ethics. The democrat, being uncertain how to proceed, experiments; the organizer, having a "ways and means" mind, seizes the moment of uncertainty, and turns it to account. For success, the organizer needs only a plan, but the democrat requires knowledge which is not yet available.

Mr. Mackinder's Proposal

Mr. Mackinder sets about getting this knowledge by asking the pertinent question: How is the world to be made safe for democracy? As a result of his investigations he makes specific recommendations. To create the conditions precedent to an effective league of nations, he says, we must see to it that Eastern Europe is divided into self-contained nations. It is a vital necessity, he holds, that there should be a tier of independent states between Germany and Russia. Practically, he thinks, the realization of our hopes for the future turns upon the restoration of Poland and Bohemia to a complete national existence. In point of fact, the states indicated have been authorized by the Peace Conference and are now in some sort of being. We may, therefore, pass over his recommendations for action to examine the considerations upon which these proposals are based.

The Menace in German Control of Russia

Briefly, Mr. Mackinder believes that these independent states are necessary because the greatest menace to democracy lies in the possibility of German control of the Russian territories. The Russian Empire occupies a strategical position which it is Mr. Mackinder's aim to point out. This he states in a formula which, at first sight, appears more or less cryptic: "Who rules East Europe," he says, "commands the Heartland. Who rules the Heartland commands the World-Island. Who rules the World-Island commands the World." Obviously this statement calls for explanation.

The "World-Island"

In Mr. Mackinder's view "the joint continent of Europe, Asia, and Africa is effectively, and not merely theoretically, an island"—the World-Island (Fig. 1). The entire argument of the book, however, represents the area in a quite different light. The "Old World" land mass is an island only in theory, for the Polar ice, grounded on its northern shore, makes circumnavigation impracticable, if not impossible. The continent is the World-Promontory, stretching southward from a vague, inaccessible, and

uninhabited north. It is strategically the ultimate peninsula, free from the menace of attack from a wider land behind.

Island, continent, or promontory, this area is, and must ever remain, of controlling importance in the affairs of men. True, it occupies only one-sixth of the surface of the globe, but it holds (with its adjacent islands)

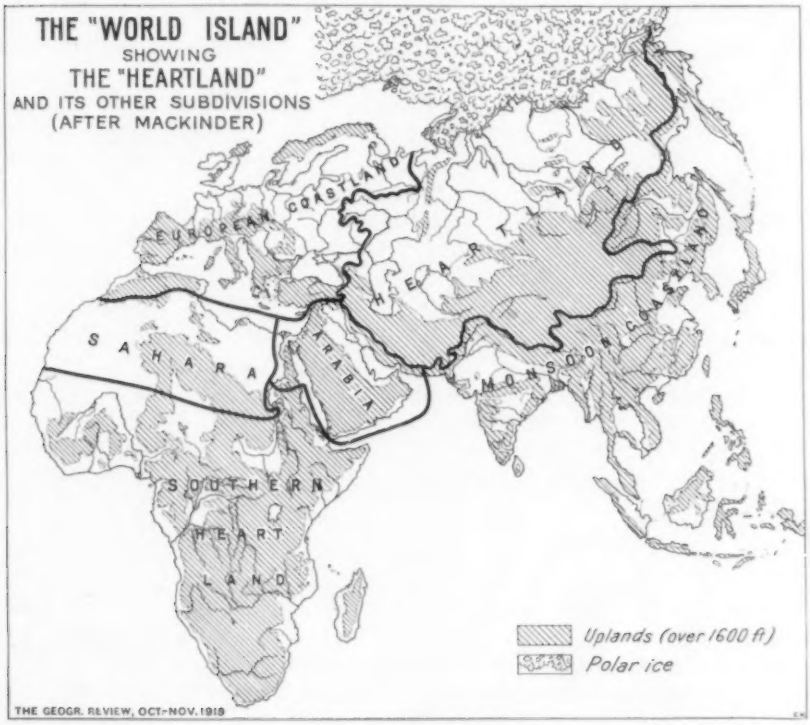

FIG. 1—The "World-Island" showing the "Heartland" and its subdivisions (adapted from Mackinder, Figs. 15 and 16). Scale, 1:150,000,000. The World-Island is an island only in theory, for the Polar ice makes its northern shores inaccessible and, from the standpoint of human development, turns it into a "World-Promontory."

fifteen-sixteenths of the world's population. No development of other lands in the future is likely, Mr. Mackinder thinks, to affect materially this proportion. Within the continent, again, four-fifths of the inhabitants live in two regions (the European Coast Land and the Monsoon Coast Land, or "Indies") which together measure only one-fifth of its area.

UNEVEN DISTRIBUTION OF POPULATION

The uneven distribution of population thus indicated suggests an intricate problem which Vidal de la Blache was considering in the *Annales de Géographie* (1917-1918) at the time of his death. Mr. Mackinder, however,

only goes so far as to point out that the populous "coast lands" of the East and West resemble each other in having numerous rivers navigable continuously from the ocean and in having a widespread rainfall on the plains as well as on the mountains. They are fertile and accessible from the ocean, in contrast with other lands which are sparsely populated, scantily supplied with rain, and inaccessible by water.

Of these other regions the most obvious is the Sahara, stretching from the Atlantic to the Nile Valley. It forms an unbroken boundary between the white and the black man. East of the Sahara lies Arabia, extending, as re-defined here, from the Nile to beyond the Euphrates, and from the Taurus to the Gulf of Aden (see Fig. 1). As a land it is half desert, half dry steppes. At this point one cannot but feel that the author has been tempted to oversimplify the facts in the desire to delimit the continent into a few major areas. Certainly the "Fertile Crescent" of the Near East cannot be accepted offhand as an integral part of Arabia. It has played its highly significant rôle in history, not as an arid region, but as one eminently productive and populous. The more effective way of regarding this remarkable strip is not as an oasis in the desert, but (in the manner of Hogarth, Breasted, and J. L. Myres) as a fertile zone exposed on all sides to invasion.

The "Heartland"

East of the Tigris, and beyond the rim of the Persian mountains, begins the vast region of continental and Arctic drainage which Mr. Mackinder denominates the "Heartland." In extent, it occupies about one-half of Asia and a quarter of Europe. But the Heartland has none of the sameness of the Sahara. It includes the great uplands of Iran and Mongolia; the deserts and river valleys of Turan; the inaccessible heights of Tibet; the amazing sweep of the grasslands and forests of Russia and Siberia. One feature alone permits of its classification as a unit: the rivers—and they are many and great—flow either into salt lakes, like the Caspian and Aral Seas, or into the frozen Arctic. Thus the Sahara, Arabia, and the Heartland together constitute a broad, curving belt extending across the continent from the Arctic to the Atlantic Ocean. Mr. Mackinder is at pains to emphasize the inaccessibility of these lands to ships, but the more immediate contrast is brought out by comparing the sparse, nomadic population of these regions with the dense, sedentary population of the "coast lands."

Mr. Mackinder's definition of the Heartland is a variable quantity. It starts from an acceptance, as a physiographic unit, of the distinctive area of internal or continental drainage. It ends in the strategical conception of a territory "to which, under modern conditions, sea power can be refused access." Now it is imperative that in this new study we should avoid confusion of thought. If new terms are to be invented, they should not be

applied, at the very outset, to quite different entities. It is useless to capitalize the term "Heartland," if we do not give it a precise meaning.

The narrower meaning is the more acceptable. In Mr. Mackinder's book we are in the presence of a very large conception of the *modus operandi* of human history. This conception is not new, but only of late has it been rapidly gaining ground. One might give a long list of the men who have added significantly to our knowledge of the subject during the last fifteen years. The method of approach involves the theory of a center of dispersal

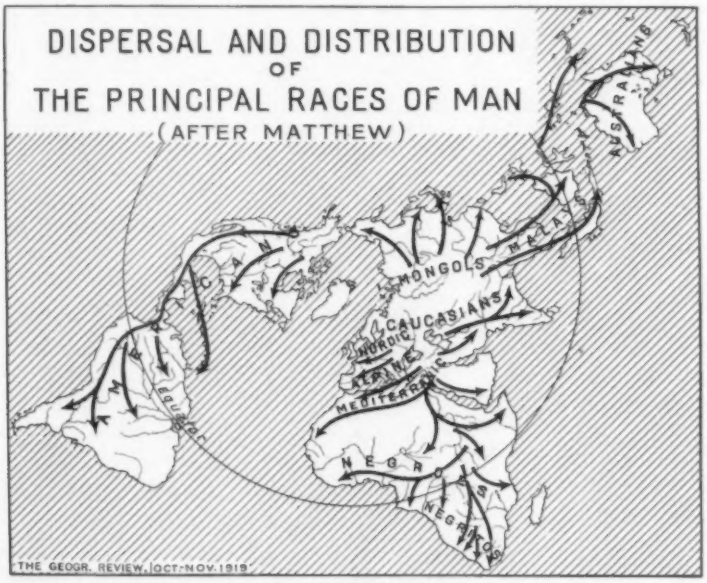

FIG. 2—Map of the world showing the dispersal and distribution of the principal races of man. Scale, 1:300,000,000. (Reproduced from Fig. 6 in W. D. Matthew: Climate and Evolution, *Annals New York Acad. of Sci.*, Vol. 24, 1914, pp. 171-318.)

of the human race in Asia. From this center have come the successive invasions which have overflowed the marginal lands—the Near East, India, China, Europe—in prehistoric, ancient, and medieval times (Fig. 2). If we take this center of dispersal as corresponding broadly with the area of continental drainage, we may see that the migratory movements have been from the infertile to the fertile regions, from the less to the more densely populated areas. It is far from unimportant that there has always been a disparity of man power on the part of the invaders of the coast lands.

MIGRATION FROM THE "HEARTLAND"

Migration from the Heartland to the marginal lands of the continent is not a theory, but a conspicuous fact. Furthermore, these movements have followed definite lines laid down by the abiding physical features of

the globe. Thus the elevation of Tibet and the sink of the Caspian are obstacles which men have always been compelled to go around. China and India are protected against invasion by the most massive upland in the world. Consequently, the only entrances to these great lowlands are difficult routes and passes skirting the barrier. Westward, the situation is wholly different. The Caspian has deflected invasions to the south or north, into the lowlands of the Near East or across the grasslands into the European peninsula, but it has been no barrier. In contrast to China

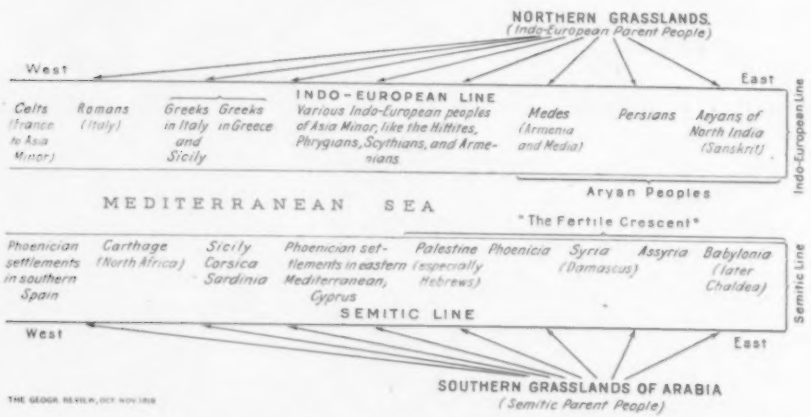

FIG. 3—Diagram suggesting the two lines of Semitic and Indo-European dispersion. (Reproduced from Fig. 112 in J. H. Breasted: Ancient Times: A History of the Early World, Boston, 1916.)

"The actual lines along which these peoples lie are of course not straight. The lines sometimes overlie each other, as in Sicily, mentioned in both lines. Egypt, which geographically belongs in the southern line, has been omitted because it is not purely Semitic, although closely related to the Semites. Notice also that in the West the two races face each other for the most part across the Mediterranean; in the East they confront each other along the 'Fertile Crescent.' The Hittites, included above among the Indo-European peoples, became so in language, though evidently not originally so in blood."

and India, the western lands lie open and exposed to attack by every wandering tribe. "The key," Mr. Mackinder says, "to some of the greater events of ancient history is to be found in the subjection of the peoples of the agricultural strip [of the Near East] now to this and now to that neighboring race of superior mobility. From the northeast, with all the vast depth of the Heartland behind them, the horsemen came down from the Iranian upland into Mesopotamia; from the south, with all the depth of Arabia behind them, the camel men advanced northeastward against Mesopotamia, northwestward against Syria, and westward against Egypt; from the northwest, whether across the peninsula of Asia Minor or directly to the Levantine shore, came the shipmen against Syria and Egypt, having behind them all the waterways of Europe" (p. 114; cf. Fig. 3). Similarly, at a later date, western Europe was subjected to the same pounding, and from the same agents—Huns, Avars, Magyars, Turks, from the Heartland; Saracens from the south; and sea-roving Norsemen from the northwest.

Systems of Defense Against Invasion From the "Heartland"

Here, then, we come to the point that lends to the study of migrations its transcendent importance. In default of natural defenses, the peoples of the Near East and of Europe have been compelled to protect themselves by setting up politico-military organizations. Such organizations have come into existence, in all cases, as a result of pressure; and, by way of contrast, unexposed areas have remained backward and unprogressive to the present day. It follows that an exhaustive study of the rise and development of political government is an essential prerequisite to an understanding of the modern world. It is quite useless to teach political theories when we do not comprehend political facts. To be of value, this study must be conducted on the basis of the comparative method. We must consider the experience of the East as well as of the West, for men everywhere have responded in similar ways to similar situations—the Romans also built walls to keep off enemies. So, we may see, the new study of geography leads at once and inevitably to an investigation of the foundations of modern civilization.

It is not, however, to be supposed that Mr. Mackinder has undertaken to deal with the whole of this most intricate matter, even in its primary geographical aspect. His aim, in the present book, is twofold. First, to show that the study of geography, carried on with due regard to scientific method, can be depended upon to throw light on practical political problems; second, to add directly to our knowledge by taking up one special phase of the general subject. He has not made a comparative study of the spread of political units throughout the world, but he has presented a most informing discussion of the conflict, ceaseless since the dawn of history, between sea power and land power.

The Strategy of Empire: Land Power versus Sea Power

Mr. Mackinder's ambition, it is plain, has been to offer an examination of the strategy of empire, taking the whole world for a map. To be wholly successful in such an effort is probably impossible in the present generation. There is more than a trace of the persistent European bias in the author's mode of thought. That he is an Englishman, is apparent in the fact that he starts from "the seaman's point of view," though this actually narrows his outlook. That classical studies have established a major nucleus of ideas in his mind is evident when he takes the Greek seas, the Greek marginal civilization, and the Greek conquest by the semi-barbarian Macedonia as a pattern applicable throughout history.

With this approach, however, we are led to see a succession of empires, based upon sea power, each of which has been overthrown finally by a land attack. The success of land power, in each case, has come from a broadening of the field of operations and the seizure of the seaman's base of supplies. "The man power of the sea must be nourished by land fertility

somewhere, and, other things being equal, that power will control the sea which is based on the greater resources" (p. 45). The moral is obvious: this has been a war between the marginal and the continental powers. "We have been fighting lately, in the close of the war, a straight duel between land power and sea power, and sea power has been laying siege to land power. We have conquered, but had Germany conquered she would have established her sea power on a wider base than any in history, and in fact on the widest possible base" (p. 79).

The Case of Greece

At an early period in European history, we find a seafaring people settled round the shores of the Aegean "sea chamber." The center of

FIG. 4—The Greek seas, Aegean and Ionian, showing the Cretan insular sea base, and the Greek peninsular sea base; also the march of Xerxes to outflank the sea power of Athens. Scale, 1:13,600,000. (Reproduced from Mackinder, Fig. 3.)

civilization in this pre-Greek world was the island of Crete; and Crete (like England) was the base of a relatively wide-extending sea power. The second phase of Aegean development shows this power overthrown by attack from the mainland. Horse-riding tribes of Hellenic speech, coming down from the north into the peninsula, subjugated the earlier inhabitants and, finally, from the peninsular base conquered Crete itself. At the next stage, these Greeks have, in turn, expanded east and west, colonizing the shores both of the Aegean and the Ionian Sea. They have set up a civilization on the marginal lands of three peninsulas—each one exposed to attack, and in the end to be attacked, from the rear (cf. Fig. 4). The first blow came from the Persian land power. After seizing the Greek cities on the eastern shores of the Aegean, Persia proceeded to reduce the central land base of Greek sea power by a vast turning movement by way of the Dardanelles and Thrace. The Persian victory did not lead to an actual

conquest. This was reserved for Macedonia, the half-barbarian power seated in the root of the Greek peninsula. The Macedonian land power ended "the first cycle" of sea power, by seizing the land bases, not only of the Greeks, but of the Phoenicians and Egyptians as well. Alexander thus made of the Eastern Mediterranean a "closed sea," by which the author means that "without the protection of a navy, commerce moved securely over a water-way because all the shores were held by one and the same land power" (p. 48).

The Case of Rome

The development of the Western Mediterranean turned upon the contest between the rival sea powers of Rome and Carthage. In the First Punic War Rome "found herself" as a sea power, based upon the fertility of Latium. After it, she enlarged her land base by annexing peninsular Italy. In the Second Punic War Hannibal outflanked the Roman sea power by conducting an army into Italy. He repeated the strategy of Xerxes, with a like result. After the war, Rome extended her dominion over the coast lands of Spain and Gaul. In the Third Punic War Rome conquered Carthage and made of the Western Mediterranean a "closed sea."

The union of the eastern and western basins followed the Roman conquest of Macedonia, "Asia," and Egypt. The sea victory of Actium enabled her to make a closed sea of the Mediterranean. Rome brought under her dominion the entire circuit of Mediterranean lands, but from beginning to end of her career she remained a marginal power. Her empire fronted the Mediterranean, not the barbarian tribes of central Europe, or the Oriental powers of the Near East. Her frontiers must be regarded as demarking the limit of penetration from the Mediterranean coast. In Mr. Mackinder's words, "As the Rhine and Danube, defended by the legions, marked the extent of Roman penetration northward from the Mediterranean, so the upper Euphrates, where it flows from north to south before bending southeastward, marked the limit, defended by other legions, of their eastward penetration from the Mediterranean" (p. 114).

The Medieval Siege of Europe

As a consequence the fate of Rome, despite her more elaborate organization, was that of Greece. The later marginal civilization, though far more extensive than the earlier, was overrun by peoples from the deep interior of the World-Promontory. The situation at the downfall of the Roman Empire appears to us, of course, as exceedingly complex. This need not disguise the fact that the break-up was due to invasion from the Heartland and Arabia, and this not once, but many times in rapid succession; and not by one, but by every possible avenue of approach. The outcome of

these invasions was what Mr. Mackinder lalls "the medieval siege of Europe" (p. 61). Land power had reduced the marginal sea power to its last foothold in the western end of the European peninsula.

Here it would seem that a pardonable eagerness to reach that point in

FIG. 5—Map showing the German *Marken* against Slavdom at the beginning of the fifteenth century. Scale, 1:16,000,000. Based on F. W. Putzger's "Historischer Schul-Atlas zur alten, mittleren, and neuen Geschichte," 41st edition, Leipzig, 1918, Pls. 15a, 17b, 18a, 18, 19b, and G. Droysen's "Allgemeiner Historischer Hand-Atlas," Leipzig, 1886, Pls. 71 and 30-31 inset.

the narrative at which Western Europe turned the tables on her invaders has led Mr. Mackinder to neglect considerations of vital importance for his own argument.

The Defense of Western Europe

Let us keep steadily in mind that the Heartland and Arabia laid siege to Europe. "Only to the southeast were there practicable oasis routes leading to the outer world; but these were closed, more or less completely,

FIG. 6—Map showing the new tier of states between Germany and Russia. Scale, 1:16,000,000. Based on a map prepared by the American Geographical Society for the Committee on Public Information, showing the new boundaries in Europe as recommended to the Supreme Council of the peace conference. (See also Mackinder, Fig. 31.) None of the new states is at present completely defined except Austria; the map is only intended to show the probable configuration.

from the seventh to the nineteenth century, by the Arabs and the Turks" (p. 62). Let us understand, too, that the seamen of Europe broke the siege

in characteristic fashion, "once the Portuguese had found the ocean way into the Indian seas." "Europe had taken its foes in rear; it had sailed round to the rear of the land, just as Xerxes, Alexander, Hannibal, and the Crusaders had marched round to the rear of the sea" (p. 66). The view is illuminating, but, as presented by Mr. Mackinder, diverts attention from the means adopted for the defense of Western Europe against invasion. The fact is that, instead of building walls, medieval Europe adopted the alternative method of setting up military organizations on exposed borders. In central Europe, therefore, there was erected a line of *Marken* extending from the Baltic to the Adriatic Sea (Fig. 5). These defensive units existed in 1914, in the consolidated form of Germany and Austria.

The New Menace of Russia

It is, then, quite out of keeping with the historical background to seek for parallels "between the half-Greek Macedonians and the half-Latin Germans" (p. 61). The real Macedonia to our marginal civilization is the semi-barbarian power situated at the root of the European peninsula, the power known to us as Russia. The parallel was complete in 1914, whatever it may appear to be today. Mr. Mackinder strikes this keynote when he says:

> The map reveals at once the essential strategic aspects of the rivalry between Russia and Britain during the nineteenth century. [Britain did what she liked on the ocean.] Russia, in command of nearly the whole of the Heartland, was knocking at the landward gates of the Indies. Britain, on the other hand, was knocking at the sea gates of China and advancing inland from the sea gates of India to meet the menace from the northwest. Russian rule in the Heartland was based on her man power in East Europe and was carried to the gates of the Indies by the mobility of the Cossack cavalry. British power along the sea frontage of the Indies was based on the man power of the distant islands in West Europe and was made available in the East by the mobility of British ships" (p. 165).

We misunderstand the situation when we call the Germans "Huns" and identify them with the invaders from the East. Germany and Austria constitute the system of defense, set up by Western Europe, against those invaders. It is true that the system was temporarily forgotten while the marginal powers to the West (like later Greeks) were struggling among themselves for colonial dominions and while Russia (the later Macedonia) was consolidating her power in Europe and reaching out to the Pacific. The era of extensive movement may be said to have closed when Russia abandoned her foothold on the American continent and turned her attention to Constantinople and India. Meanwhile, the Germans had been studying history and rediscovering the significance of their geographical position.

In the second half of the nineteenth century the Russian Czardom threatened all the marginal lands, and the Germans of Prussia and Austria awoke, as France and England had long before, to the peril of the situation.

They "determined," as Mr. Mackinder puts it, "to subdue the Slavs" (p. 137). What followed was "the *volte-face* of 1895, when was concluded the incongruous Franco-Russian alliance between democracy and despotism" (p. 161). "Russia allied herself with France against the Germans" (p. 162).

Relation of Germany and Austria to Western Europe

It must be evident to any one not blinded by recent events that, in the opposition to the power of the Heartland, the interests of the Western powers (England, France, and Germany) were identical. In actively opposing the Russian menace to the marginal lands, Germany and Austria were carrying out, for good or ill, the historic mission which Western Europe had entrusted to them. Germany is an integral part—the defensive frontier—of Western Europe. If her politico-military organization is a menace, it is the logical product of Western ideas.

The beginning of our present troubles goes back to the break-up of Europe at the close of the Middle Ages. Freed for a time from the Eastern pressure, Europe fell apart into a number of relatively smaller states, pursuing independent territorial aims. The late William T. Stead, in a moment of illumination, advocated the establishment of "The United States of Europe." Had such an organization been effected in the eighties, we should not have had the recent exhibit of Western Europe accepting an alliance with the Heartland enemy to destroy its own system of defense against that power. The war has not been "a straight duel between land power and sea power"; it has been another case of the internecine strife of Athens and Sparta.

Mr. Mackinder is of the opinion that Germany failed by reason of uncertainty of aim—"she fought on two fronts without fully making up her mind on which front she meant to win" (p. 191). But Germany failed, in reality, because she did not identify her cause as the cause of the marginal lands against the Heartland and the remoter East. She failed strategically because her leaders (like Napoleon) neglected to learn from Alexander that any advance into the Heartland must, of necessity, be preceded by a consolidation of the marginal sea power and the establishment of a closed sea.

The New Defense of Western Europe

The essential correctness of this view is shown in Mr. Mackinder's own recommendations. His proposal, in short, is that, having destroyed the old defensive units, we must forthwith proceed to erect a new tier of politico-military organizations between the Baltic and the Black Sea (Fig. 6). Any such system as that proposed is foredoomed to failure so long as Germany is not made to identify herself, in spirit and in interest, with Western Europe. To leave the new states between the upper and nether millstones

is to invite destruction. And who, indeed, will guarantee that the Slavic *Marken* will be less disposed to militarist ambitions than the Teutonic? For a long time to come the "League of Nations" will be forced to maintain these new states on a war footing against the Russian peril. Who will guarantee that one or more of these states may not be disposed to march westward? May we not be whetting the edge of the Eastern sword to our own undoing?

The Safety of Democracy Demands Knowledge

Only the greatest wisdom can possibly avert the evils that threaten our common Western civilization. "The one hope of the future is that even democracy may learn to take longer views" (p. 180)—by acquiring knowledge. The patchwork of diplomatic compromises that we call peace is no sufficient guarantee of the future. Russia, as in a mist, lies portentous in the background. The European peninsula is visibly in ruins. The United States seems disposed only to abide within the fancied security of its western island. On England devolves the burden and responsibility of the hour. She is fortunate in having men of Mr. Mackinder's vision.

THE LAST EXPLORATION OF LIEUTENANT MARQUES DE SOUZA: DIARY OF A JOURNEY ON THE ANANÁZ RIVER, BRAZIL*

PART I†

The discovery of the Rio Theodoro by Colonel Roosevelt in 1914 provided the key to a large region drained by that river and its tributary streams. It was to be expected that thereafter one after another of the tributaries would be traced to the main stream. The first of these tributaries to be explored was the Ananáz,[1] or Pineapple, River. The work was carried out, under the direction of Colonel Rondon, by Lieutenant Marques de Souza, who was attacked and killed by the Indians. One of the camaradas *who had been out hunting returned to camp after the tragedy and discovered the Indians before they saw him. After watching for seven hours until they left camp, he obtained de Souza's diary, an invaluable record, descended the bank of the Ananáz River to the main stream, and after twenty-four days' voyage down this river found the first rubber gatherer. After a journey of twenty-two days farther down stream, all of this on foot, he finally managed to secure a canoe.*

The above facts are related in a letter from Colonel Roosevelt to the Director of the American Geographical Society under date of December 21, 1915, and were published in the January, 1916, number of the Geographical Review *(p. 50). Later on, Kermit Roosevelt, who accompanied his father on the exploration of the Rio Theodoro, obtained a copy of the diary of Lieutenant de Souza and at the request of Colonel Roosevelt loaned the diary to the Society for translation and publication in the* Review. *The Councilors of the Society and the Editors have a double pleasure in publishing this diary; first, because it was Colonel Roosevelt's wish to have it published and, second, because it is a record of an important piece of exploration in the heart of South America. The tragic death of its author leaves the record incomplete as to the character of the whole course of the Ananáz River. The diary is prefaced by a summary introduction which appeared when the diary was first published, in the September 13, 1915, issue and subsequent issues of the* Jornal do Commercio *of Rio de Janeiro.*[2]

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* Translated from the Portuguese and published in the *Geographical Review* at the request of the late Colonel Theodore Roosevelt.

† Part II, completing the diary, will appear in the next issue of the *Review*.

[1] Where referred to previously in the *Review* the name of the river has been spelled Ananás. The form Ananáz seems to be preferable, however; it is this form that Colonel Rondon uses in the book cited below.

[2] In the official account of his activities as chief of the Brazilian Telegraphic Commission, Colonel Rondon, in view of this circumstance, makes only brief mention of Lieutenant de Souza's exploration of the Ananáz River and refers the reader to the published diary in the *Jornal do Commercio* (Conferencias

Introduction to the Diary

We are enabled today to reconstruct, with all details, the scenes of the morning of May 29, 1915, on the banks of the Ananáz River, the day on which Lieutenant Marques de Souza of the Rondon Commission, charged with the making of a survey of that river, fell a victim to the arrows of the Arára Indians.

At the head of a division of ten men Lieutenant de Souza had started on February 16 the exploration of the Ananáz, and through his diary our readers will become acquainted with the adventures and incidents of this laborious and daring journey, carried out in the midst of almost insuperable dangers, in which three shipwrecks were experienced in little more than three months of incessant labors.

We shall describe the scenes of May 29 with the use of the declaration made by the survivors of this tragic morning in those distant parts of the Matto Grosso wilderness.

On the preceding day the commander had put to shore and had set up his forty-third encampment. He was forced to do this because at the falls nearby. . . two of the canoes of the expedition had been broken and wrecked, and, as this left only one, it became necessary to stop and make more.

Near the right bank of the river there are two islands. The commander selected the larger one, with magnificent shade trees, for his camp . . . . The men had been properly distributed to meet the necessities of the day, some making canoes, some hunting, some fishing, and some gathering Brazil nuts. Marques de Souza had remained on the island and directed the work of the four men constructing canoes. The gigantic silent forest around seemed tranquil and, indeed, uninhabited. Still, hard by the camp, and only a few meters away, a naked group of unknown Indians were looking on and observing everything, eluding even the scent of the dog, awakening not the least suspicion of their presence nor making the slightest noise that might betray them.

The expedition, as we have already said, now had at their disposal only one canoe, and this the two men sent to hunt had taken to the far side. They had taken with them also the only two firearms, of the small number remaining with the division in condition to be used. The whole party of daring explorers were now dispersed.

Suddenly, a first arrow cuts the air, then another, and another. Both on the water side and the land side the men perceived they were being

realizadas pelo Coronel Candido Mariano da Silva Rondon, Chefe da Commissão, nos dias 5, 7 e 9 de Outubro de 1915 no Theatro Phenix do Rio de Janeiro e referentes a trabalhos executados sob sua chefia pela Expedição Scientifica Roosevelt-Rondon e pela Commissão Telegraphica, [*Commissão de Linhas Telegraphicas Estrategicas de Matto Grosso ao Amazonas Publ. No. 42*], Rio de Janeiro, 1916, pp. 202 and 205; or English version: Lectures Delivered by Colonel Candido Mariano da Silva Rondon, chief of the commission, on the 5th, 7th, and 9th of October, 1915, at the Phenix Theatre of Rio de Janeiro on the Roosevelt-Rondon Scientific Expedition and the Telegraph Line Commission, translated by R. G. Reidy and Ed. Murray, *Commissão de Linhas Telegraphicas Estrategicas de Matto-Grosso ao Amazonas Publ. No. 43*, Rio de Janeiro, 1916, pp. 237-238).

attacked by the savage Aráras. Seizing the only available firearm, Marques de Souza, bravely but in desperation, shoots into the air . . . . He attempts to shoot the second time, and the arm misses fire. The Indians gather courage and advance, shooting arrows in every direction. Betrayed by his rifle, the officer still tries a last resort. Spreading his arms in an attitude of friendliness, he exclaims: "Don't shoot me!" His heroic figure, however, and his generous gestures were not enough to overcome or move these sons of the land, who here found an opportunity to avenge the persecutions of which they had unscrupulously been made victims, for many years, in the rubber groves. Marques de Souza received two arrow wounds in his open breast and one in his abdomen. Seeing Tertuliano Ribeiro de Carvalho, the canoe maker, already dead at his feet and a companion very badly wounded, the officer throws himself into the water and, with his men, attempts to swim to the side where the canoe is. Becoming exhausted, he sinks out of sight in the strong current. And thus ends the life of this brave officer, who was one of the most worthy members of the Rondon Commission.

With the death of their leader and of another of their number, whose body was taken into the canoe just as it was sinking, with another boatman wounded four times by arrows, the men, now left to themselves and without a commanding head, are seized by a panic . . . . Abandoning the two dead bodies and the two companions who had been assigned to hunting and had buried themselves in the depths of the forest, they rowed away down the stream. One of the hunters, by a fortunate coincidence, happened to be near the bank of the river and, hearing the noise of the passing boat, threw himself into the water and joined those who fled. Of these, two were entirely without clothes. The other hunter remained there ignorant of what had happened. When the sun was high he turned his steps toward the camp, carrying with him the game he had killed. Coming along and peeping around, as professional hunters do, on drawing near the camp he heard an unusual murmur of voices, which he did not take to be the voices of his companions. He drew near with quiet and caution. Crouching down in the hollow of a rock, he noted that the camp where he expected to find his leader and comrades was now held by a large number of Indians. He could see them take the dead watchdog and wrap it in the rubber coat of the commander. He observed that they broke and threw into the water the engineering instruments with which the survey of the river had been made. From this hiding place he noted all that went on and remained in this dangerous and critical position till the rays of the evening sun softened the western horizon, unable to do anything on account of the invincible numerical superiority of the enemy.

The hunter remained in this situation through seven consecutive hours. Near nightfall the Indians, throwing themselves into the river, swam to

the other side to go to their *malócas*. Then the spy got up and made his way toward the camp, where he examined the broken remnants that had been abandoned and found among them the diary of Lieutenant Marques de Souza, a valuable relic, the original of which the Rondon Commission has delivered, on Saturday, to the family of the lamented standard bearer.

We have obtained a copy of this document, the first pages of which we offer today to the readers of the *Jornal do Commercio*.

Marques de Souza would write in a notebook, day after day, his impressions and the results of his explorations as they were made. These notes were made without any special attention to style, many times on the prow of a canoe, and they reveal, in their simplicity, the worthy officer's nobility of soul, his untiring energy, undaunted courage, and unlimited zeal for the work entrusted to him. Together with the diary there were found also the record book of the men and other small objects.

On the morrow, having given up all hope of finding his companions, the hunter decided to depart. Following the river's edge, stopping only at night, he succeeded in escaping, bringing with him the objects he had gathered up. On the 31st he came to a sandy beach and saw on it the body of Marques de Souza. He then verified the three wounds which we referred to above. With a fragment of a broken Indian pot and with an extinguished torch which he found near the body, this member of the expedition dug a grave in the sand, and buried there the body of his unlucky chief.

This *caboclo*, João Pereira da Cruz, a native of Piauhy, left without a companion, condemned to make his way across the great unknown, counting on himself alone for food, for sleep, for defense, presents a picture of deep interest to us all. For twenty-four days he traveled, making as long stretches as his insufficient food and his fatigue would permit. At the end of this time he came up with the first ranch of *seringueiros*. But it was not possible to rest there, and so for twenty-two more days he had to trudge forward. At the end of these forty-six days he met with somebody on the river who, having pity on him, took him down the river in his dugout till they caught up with his ungrateful companions who had gone on ahead. With them he arrived in Manáos nearly two months after the tragic event.

The Diary

The Start

February 16, 1915. We rose at 4:30 and soon after we took our *guarana* (a native beverage). At 5 o'clock Candido served us with a porridge of chocolate and rolled oats. The Colonel gave me his last directions, and at 6 o'clock in the morning he was traveling in the direction of Vilhena.[3] At this hour pack mules arrived from Tres Buritys[3], bringing the rest of the baggage and my dog Dick, who remained there. The Colonel left me Baroneza, on condition I should deliver her, after the expedition, in Calama.

February 17. Happily I have moved today the camp to the Ananáz River. Now, properly speaking, I shall begin my work. The pack mules, after camp had been moved, went on to Tres Buritys.

February 18. I have not yet begun my work. I sent for the canoes. There is a scarcity of large logs, so that it becomes necessary to deobstruct the river bed in order to make the first *ubá* (dugout canoe). Unfortunately I have to lie down all the time on account of my feet. I have endured it because I cannot get out from under the mosquito net, on account of the plague of bees, *piums*, *borrachudo* gnats, and such. What a martyrdom! . . . . (11.30 P. M.) I have slept little since we left Barão de Melgaço.[3] I am not able to sleep before 12 or 1 o'clock, and, even so, I wake up from time to time. I get into a terrible state of despair. I am eager to begin my work, in order to be through with it as soon as possible. There are pleasant moments in this wilderness life, but, by way of compensation, when times of bitterness and abhorrence come, one suffers more, much more, than in any other place. A minute of suffering seems like an hour. Maybe this is due to the absence of any person or friend who might afford consolation.

Homesickness

February 20. The men continue actively at work on the first *ubá*, and it is nearly ready. My homesickness presses harder and harder upon me. Heretofore when I thought of home and felt homesick, I would soon think of something else and divert my attention. I had always a friend to talk to, so that my thoughts would be occupied. Here in this far-away wilderness, this desert, without a companion with whom to exchange ideas, living in complete isolation and, worse still, prostrated in a hammock and unable to walk, with nothing to divert one's attention, time passes very heavily, and I spent it with my thoughts. It is at these lonely times that home-

[3] Vilhena and Barão de Melgaço are stations on the telegraph line near the headwaters of the Ananáz River. Tres Buritys is a cattle ranch between the two stations. For locations see maps in *Geogr. Rev.*, Vol. 1, 1916, p. 171, and in Colonel Rondon's lectures, cited in footnote 2, Portuguese version, p. 253, English version, p. 269.

sickness presses hardest upon me, longings for home, for my betrothed, for my friends.

I am inclined to think this life of an explorer is more trying than I once believed. Still let it be what it may; I only hope to begin my work soon in order to get into a place inhabited by civilized people. Today is Saturday, and oh! how much I have thought of home!

February 21. Today is Sunday, and I have spent the whole time thinking of home. At 3 o'clock in the afternoon I resolved to do my first piece of work: I made calculations on the cross section of the river and the volume of water discharged.

The First Monument

February 22. The first canoe has been completed, and the work of constructing the first monument is also ended. We expect to set it up in the clearing in the *mangaba* grove tomorrow. The monument has the following inscription: "Rondon Commission. Monument No. 1. Campo do Mangabal. Moorings for the branch from Campos dos Palmares de Maria de Molina. Monument at the landing on the Ananáz River from which the exploring division descended this river. Lieutenant Marques de Souza. 2-22-1915."

February 23. 4 A. M. Today I begin to make a map of the road from the clearing in the *mangaba* grove to the landing at our encampment. What absolute silence prevails here! From time to time it is broken by the stirring of pots, in which Candido is preparing our breakfast, and by the mournful hoot of owls, which sounds like the hallooing of a person in distress.

February 24. Yesterday I made the survey of the clearing in the *mangaba* grove on the left bank of the Ananáz. It has an extension of —. They have already begun to work on the second canoe, and at midday today we begin the third, hoping to leave here on the same day that Colonel Rondon and Colonel Roosevelt started down the Rio da Dúvida last year.

February 25. The second canoe is ready. I have worked hard. On the 23rd I went to bed at 11 P. M. and got up at 2:30 in the morning to finish the first sheet of my map. Today I make the first observations with the aneroid barometer.

February 26. Unfortunately the cashew tree that we felled for the third canoe proved unserviceable, but another was found a good way below our mooring place. I think we shall leave here on March 1.

Survey of the River Begun

February 27. I began the survey of the river in the section farther down, where they are making the third canoe. At night I worked on the daily map sheet.

February 28. Not till now, at 11 P. M., when I was getting ready the papers for the men, had I noticed it was Sunday! The last boat is ready, and tomorrow, God willing, I shall begin the work.

March 1. At 6:30 o'clock I went up the Ananáz and made the survey of it, descending the river as far as Porto Novo, the first camp. I did not get as far as the bar of Ribeirão Anta,[4] as was the desire of Colonel Rondon, for the river was badly blocked up with trees and, as I was not able to walk, it was impossible to go by land.

An Indian Garden Patch

At 11 o'clock I moved the camp, but the place is very bad, ugly, and surrounded with *igapós*.[5]

I am not well.

March 2. What a terrible place this is! Damp, dirty, and surrounded by pools of stagnant water. Tomorrow I am going to move the camp farther down, for the men who are cleaning out the river told me of a good place. At 2 o'clock in the afternoon I went out with Candido, and we explored a beautiful little meadow where purple grass grows with wonderful exuberance. It is some 300 meters from where we are and 50 meters from the left bank of a creek, which I supposed to be the Lyra. It is a place where the Indians formerly had a garden patch, and we found there a weak stalk of manioc.

This little meadow is located on the left bank of the Ananáz; it has the form of an ellipse, its greater axis measuring 350 meters and its lesser axis less than 100. Unfortunately my work has been very slow, for the river is completely blocked with trees that lie across it from bank to bank. And I am so eager to proceed rapidly in order to get home!

Vestiges of Indian Occupation

March 3. Today, at 7 o'clock, I moved the camp to a place on the left bank of the river 15 meters high. It is in the midst of reeds and is surrounded by low forest. It appears to be the site of an old native village. There are several roads and a small wooden bridge at a clear landing place, and everywhere vestiges of former occupation.

March 4. Today was a day of hard work for me. I made the survey from Camp No. 2 to Camp No. 3, and from this to the place I have selected for my Camp No. 4, for I am counting on moving tomorrow very early in the morning. I am glad of the direction which the river seems to be taking, for it runs toward the east, that is it is going away from the

[4] *Ribeirão*, a large tributary, as compared with *igarapé*, a small tributary (see legend on Map of Rio Roosevelt, 1:400,000, *Geogr. Journ.*, Feb., 1915).

[5] *Igapó*, a slough, "a temporary rivulet with no source" (glossary, English version of Colonel Rondon's lectures).

Roosevelt toward the watershed of the great Aripuanã. The outline of the daily work is nearly finished. Tomorrow I shall finish it.

We have no meat, and there is no fish or game. We are on simple soup and beans, rice, and *farinha* (manioc root grated, dried, and roasted).

Character of the River

March 5. I moved the camp; this is Camp No. 5. The forest is grown up and has much undergrowth, but the land is sandy and dry. The river continues as above. It has received several *igarapés*,[6] but instead of getting broader it gets deeper and at places is very narrow. It has some very peculiar turns, and the guiding of the canoes is very difficult. Fortunately today the troublesome bees, the mosquitoes of a thousand kinds, the terrible *motucas*, and the persistent *beruanhas* did not molest us. Now at 6 P. M. it is raining very hard. How lonely I feel when the evenings are rainy! How often I think of home, my betrothed, and my friends!

March 6. At 7 A. M. I went down the river to look it over, as I usually do before making a survey, to the place where it receives two *igarapés* on the left and one, I think, on the right. You cannot be certain, for the land is all low.

Porto dos Cananîs

I went as far as the foot bridge that the Nhambiquara Indians, a sub tribe of the Cananîs, use. To the left lie the Campos dos Palmares de Maria de Molina.[7] I searched there at the landing for a farewell message which Colonel Rondon had left for me some days ago, when he was exploring the Campos, but I did not find it. Surely the Indians must have taken charge of it. On arriving at the Porto dos Cananîs, a high place, I saw our boat without the men and supposed they had gone to where the Indians were. I was not mistaken. On calling twice, they came with two Indians and a child. Little of what the Indians said to me, in answer to questions I asked, did I understand.

Indian Savagery

I only understood clearly, as on this point they were intelligible, that the river ran toward the east all along. If it be so, who knows but that I may be on the headwaters of the Canumã? I immediately thought of a fact that had saddened me deeply on the night of February 15, a fact narrated by Colonel Rondon when he came to my camp to say good-by. He told me that, while ascending the upper Gy-Paraná, a little below the old Arára (Macaw) Camp, he saw in a cashew canoe three Indians. Drawing near he noticed that all three were wounded. One of them, an

[6] See footnote 4.

[7] Site of the station José Bonifacio (see Colonel Rondon's lectures, English version, pp. 166-167).

old man, had two arrow wounds through his neck and another in his hand; there was a child with a wound in one hand and a boy with a wound in his breast. After hasty treatment to the wounded persons he went on his way and, on arriving at the old Arára Camp, stopped and went on land. On looking around he saw that in this place a terrible struggle had been carried on, a struggle in which some native Indians had fought with all their savage ferocity. On the ground were abundant vestiges of this sanguinary battle. The matted grass, the broken arrows, and the pools of blood revealed what had taken place there. It was horrible! . . .

He had been much impressed with this incident. On arriving at Pimenta Bueno he was able to learn the whole truth.

At the old Arára Camp there was a group of Indians who were descendants of the Tapys. Among them were Marupá, Avená, the squaw Inaiôp, an old man, and a child. Marupá and his young wife Inaiôp were liked by all. They were cheerful, playful, and very much united. Some time before Colonel Rondon had sent for the Kepikiri-uats to give them presents, as he always does with all Indians. They did not wish the meeting and preferred to make a light canoe of cashew bark and go down the river to wait for him. On arriving in front of the landing place, Porto das Aráras, they stopped and went ashore. Their object was to carry away the unlucky Inaiôp. In the bloody struggle that ensued the robust, but unfortunate, Marupá perished.

It rains every evening till late at night.

First Misfortune

March 9. This poor notebook of mine, which has been with me from Porto Alegre and since August, 1908, has been lost for two days. I am going to transcribe the notes I took on the 8th. Yesterday, when moving the camp to this place, I was about to tie up at Porto dos Indios, when my canoe struck a log and, owing to the strong current, upset, and I lost all my food, many small objects, and all my matches. Fortunately I saved the instruments. I have only eighty matches—all that I was able to get together from the men. I have already made arrangements to send João with an Indian to Tres Buritys to see if I can get, at least, one package.

In this my first misfortune I lost also the notes that I was making, my purse, little scissors, mirror, and field glasses, small articles, but indispensable on an expedition. Still, I thanked God I have saved the case containing the expedition papers; and my watch still runs in spite of the formidable bath it got. The Indians are constantly in our camp, with nothing to do, happy in the nomad life they lead. Even now a group of women is by my side, laughing and talking every moment. In them joy prevails, while in me, sadness.

My longings for my loved ones, the misfortune of yesterday, the absolute lack of game and fish as food for the men, the condition of the river, every-

where blocked with trees, and indeed a thousand little things, are the things that make me sad. I am eager to leave this region and reach another, where the woods and the river may furnish me some food.

Sabaneze Indians

March 11. The Indians did not come around yesterday, but instead they stole two axes from me, the best ones I had. On the 9th, for the second time, there came the most handsome Indians that I have seen in this region of the Nhambiquaras. I thought they were Sabanezes. They are of a light complexion, with a reddish skin; their bodies are shiny and they have beautiful muscles. My first concern was to take a photograph of them; but when I had set up the tripod and had placed the camera to set the focus, the men suddenly snatched up their bows and arrows, and the women their *baquités* filled with pineapples, and made away so quickly that I was not able to get even a snapshot. There remained in our Camp No. 4 only two Indians from the village a kilometer away. I succeeded in taking three snapshots of these without exciting their distrust. There, also, I met an Indian who was very old, but he was still strong and cheerful.

At 11 o'clock João arrived. He had gone to Tres Buritys and, as he did not find José Francisco there, went on to José Bonifacio. Happily he brought seventeen boxes of matches—enough for two months!

Indians from José Bonifacio

I set up the camp today on the left bank. It is our sixth camping place. I am glad to say the river is better. It is a little broader but very deep, and, in place of the thicket of bushes, we have cane. Solid earth is scarce. Everywhere the country is inundated. At 3 P. M. a group of Indians from the *malóca* (village) of Nanhila, near José Bonifacio, came. They had come with João as far as the village near our camp. I have been in our Camp No. 6 since 12:30 today. The position is high, but the woods are grown up with bushes and weeds. In the center is a clearing.

March 12. The group of Indians from José Bonifacio came in—Iceutê, Mainlindê, Camaindê, and two fine, lively boys. They are going on with João Perú to the open fields to look for cattle, for we are now living on *farinha* and rice. The Indians returned at 3:30, having done nothing. They spent the time in our tent imitating birds and animals with wonderful perfection. At 5:30 they went away to José Bonifacio.

March 13. We moved today to Camp No. 7, on the left bank of the river. At noon six men went out to the open field to kill an ox. We are feeling weak. We have had neither beans nor meat for a long time. At 3:30 we heard some shots in a north-northwestern direction, and we waited without dinner till seven o'clock for a man to bring us meat. Unfortunately he did not come, and we had to get along on coffee. I have a horror of rice and *farinha*. I am thinking of home every moment.

Tagananí Indians

March 14. Today is Sunday. At these times I think of the Sundays I used to spend at home. I am oppressed with homesickness. The men have arrived with part of the ox, the rest having been left till the afternoon. At 10 o'clock I heard Indian shouts. At 10:30 the Indians arrived at our camp. They are Tagananís. They brought us presents of manioc, and I, in turn, gave them beef. After giving me certain information, they said they were going lower down to wait for us on the bank of the river; on passing I should shout, to be certain of them, the following: "Taganano-cheriloculato-chiro." They gave me information about the affluents and their names. This river they call "Caruiduiandé."

I made today the survey of the river between Camp No. 6 and Camp No. 7. It rains constantly, and the weather is cloudy and damp. I was obliged to set up camp here, where we shall delay two, three, or four days. According to what the men tell me, the river is still blocked, though not so much.

The Blocked River

March 15. It is a month today since the Colonel made us his farewell visit, and—a great coincidence—the men found at nearly the same hour that he arrived in our camp, the message he had left on a pole at the foot bridge that the Cananîs use for crossing the river. The message reads:

"Ananáz, or Carumuriarú, River, 2-11-1915. A good trip to the undaunted explorers of the Ananáz, or Carumuriarú, River. P. S. A little lower down, Heron Creek comes in."

I had expected to find this message on one of the poles of the foot bridge that the Indians use in crossing the river at the place of our camp, and I thought we had passed the Heron and Longuiaré Creeks already. Surely now we shall find them, and the river will offer better conditions for navigation. There is not a day or a night it does not rain. The sun is completely demoralized, for it comes out very little.

March 16. The horrid rain will not stop; day and night it rains. I made today the survey of the river between this camp and the next, Camp No. 8. Rarely does one see a high bank. The view gives one the impression of a great plain covered with water, having in the middle a strong current, varying from 5 to 25 meters in width. The woods are low, grown up with bushes like a swamp, with thickets of cane which appear to grow outward from the bank to close up the river. It is impossible to get by without first cleaning out the river.

In the elevated places the woods are clearer, and the trees are 20 to 25 meters high, and more. It is not only the thicket that blocks up the river, it is the fallen trees, felled by the action of time and by the stone or steel ax of the Indian. There are logs 80 centimeters thick, and the men have great difficulty in cutting them. They left today a log 40 centimeters

below the surface of the water, which does not obstruct the passing of the boats. Tomorrow I move the camp. The water is lower, making necessary more work to cut out the logs. It is raining. The water is rising, and we cannot get along in this place. Indeed it is a constant struggle, and one which I have to keep up a long time in order to come out victor.

Colonel Rondon told me that in four or five days from the time I left Camp No. 1, I should be at the bridge of the Cananîs, where he left the message found by the men yesterday; but it has already been sixteen days. Today I made, with the help of the men, a raft of two boats to carry our supplies. From now on it will not be necessary, in moving the camp, to send the boats back on a second trip to bring the load that we have not been able to carry on the first trip.

March 17. Today, early, I moved to Camp No. 8 on the right bank of the landing at the bridge of the Cananîs, where Colonel Rondon left the message for us. Thank God, the raft came through safely. Contrary to my expectations, it did not bring everything, the beef having increased the load a great deal. This was due to the green poles used in building the raft. As soon as these dry, she will carry all the freight and five men.

More Indians

Today I received a visit from seven Indians. They brought me nothing and wanted some beef. One of them behaved badly and was defiant. I was stern with him, and they soon departed. I am eager to get away from this repulsive tribe.

March 18. The day passed without any change in the aspect of things.

March 19. I moved today to Camp No. 9. I was alarmed about the raft, which took in water twice. The river has improved a little, but has some dangerous turns. Two Indians, Maloquinindê and Taquintidê, spent the day with me, and the scoundrels did not make me any presents.

March 20. We are nearly at the end of the month, and I have done comparatively nothing. The narrow river does not allow you to make a kilometer a day of survey. As far as this place it has received only two large tributaries, which contribute much to its improvement over the section above. These tributaries are the Tiravé and the Heron. The Longuiaré, of which the Indians spoke, cannot be far away, as also the Marciano Avila, where the Tagananís live, who visited me at Camp No. 7. I am anxious to get down to hard work, in order to get home as soon as possible, for my homesickness is great.

March 21. I moved to Camp No. 10, 30 meters above water. I never saw such a plague of insects.

March 22. In order to do my map drafting, I was obliged to stay under the mosquito net, on account of the *piums, borrachudo* gnats, *carrapanás* (long-legged gnats), and a thousand varieties of bees. At 12 o'clock the

canoe that was coming after the provisions went back because the Indians had blocked the river.

I went down to meet them and verify the fact. We heard whisperings, and I shouted "Tagananís" three times. Not until the fourth shout did they answer me, and, soon after, they gave me some manioc roots, and one of them helped me to cut the tree that lay across the river; I went on down to where the men were at work. There I found an Indian, who was talking in a friendly way with the men. On coming back I observed that the river was better. There were beautiful stretches and broader, but still it was blocked in many places by snags and trees that lay fallen across it. At 3 P. M. I arrived at camp and found a group of Indians from the village of Camanhã. They had brought me four baskets of manioc, but, as always, for exchange.

Improved Character of the Stream

March 23. Today I made the survey of the river. I began to work at 6:10 in the morning and finished at 1:40 in the afternoon, as far as the next camping place, Camp No. 11. The river is much broader in places, and there are many spots of solid ground. As the river gets broader the land seems to become better. The solid spots extend toward the center and are very high, from 10 to 30 meters.

March 24. I moved at 6:30 to Camp No. 11, on the right bank of the river. The land is high, sandy, and dry 80 meters from the bank of the river. I always pass critical moments in moving the camp, because there are stretches of the river where the boat runs against driftwood or against logs and is carried away by the current. At 6 P. M. the men came back from their work, and the master workman, Terto, informed me that the river was narrower and getting deep and full of bends. The spots of solid ground were more numerous and were covered with high forests without undergrowth, the trees being very branchy. The woods where we are encamped are higher and very different from those behind us, for there are many varieties of hard timber and many rubber trees. Our camp was placed just above an Indian road running along the bank of the river.

When shall I get to Manáos?

Longuiaré Creek

March 26. At 6 A. M. I began the work of survey and finished at 10:30. At midday we moved to Camp No. 12 on the right bank of the river. At last we have found the long-expected Longuiaré Creek. It only remains for us to find the Marciano Avila, and after this the river ought to be better. Here it is narrow and deep, 6 meters deep in places where it is very narrow. The spots of solid ground and the high forests

continue to improve. There is neither game nor fish. At last I am enjoying health, but this terrible itch will not leave me.

March 27. This afternoon the men brought me good news. The Ananáz receives three tributaries on the right side, the second being eight meters broad, and is navigable for a good distance without interruption. I only pray God that we may be fortunate and make the trip as quickly as possible. These first days of the trip will give me some new experiences, but I shall soon become accustomed to it. Now indeed I am beginning a life of work. I have a great deal to do during the day surveying and at night drawing this awful daily map. Today is Saturday, and, as always on Saturdays and Sundays, I think a great deal about home. When shall I have the happiness to be at home? Maybe in June.

March 28. At 6:15 in the morning I moved to Camp No. 13. The river has really improved, but not as much as I expected. We made a record; for, at the same time we were moving and carrying everything with us, I made the survey of the river and broke the record of distance traveled, for this camping place is 6,700 meters below Camp No. 12.

Many Bends in the River

March 29. From the exploration that I made on land I learned that the rock wall that passes through our encampment extends a kilometer to the north, and from there another of different nature continues. This great wall varies from 5 to 8 meters in height, and above it extends open *campo*. This open land is from 26 to 30 meters above water level.

March 30. At 6:30 I went to survey as far as the Camp No. 14. The river has some stretches that are worse and very quick turns. I surveyed 3,881 meters, and it has more bends than the whole section between Camp No. 12 and Camp No. 13. On the right bank of the river is to be seen a beautiful natural meadow, the same that Laurindo saw from the top of a tree at Camp No. 13. It runs along the river but gets farther and farther away until it disappears from sight.

March 31. It is a month since I left the first camp. How slowly this month has passed, and how little work I have done! If I could have foreseen all this, I should not have allowed the men to live on *farinha* and rice at the beginning of an exploration in which we have gone only 30 kilometers out of 1,200. Let everything be, however, as God may wish it.

Illness Begins

April 1. We moved to Camp No. 15. The river has grown so much better that today we continued our voyage. Everything goes well, except that I am troubled with itching and with my stomach.

April 2. At 5:30 I moved the camp. At 5 o'clock I went into camp, having made 8,000 meters of survey. We found a beautiful meadow, and

there the river is 22 meters wide. We thought the river would go on improving constantly, but, suddenly, it begins to broaden until it is 10 meters wide. In the afternoon it got broader but near our camp it is better.

April 6. I have been very ill; however, I have worked when I could.

April 8. Yesterday at 10 o'clock, on account of the state of my health, I was obliged to leave off surveying and go to bed. Only my state of health, which has changed a great deal in these last days, could oblige me to abandon a work which, with so much pleasure, I have begun and which I was carrying out with great satisfaction, in spite of the thousand reverses that have hindered me. I know that the responsibility of this work, in charge of which Colonel Rondon has placed me, is very great.

But what shall I do? Shall I sacrifice my life without results camping on one of the banks of this marshy river from which I have no resources and with no hope of improvement? Surely not. Weak with fever, with intestinal troubles, and with a stomach unable to hold any food, I can only submit to the kind of food I have at my disposal. This, my act, was absolutely not prompted by any impression I have of my health. It was not fear that moved me. I have become ill many times and, thank God, have never lost courage. I have always had the strength for my work.

Therefore, let my chief judge of my case after he hears it.

The life I have led these last days has been terrible. There was one day when we spent seven hours at night on a little knoll only two meters square, consisting of damp earth and situated in a mud hole surrounded by palms.

Food Difficulties

This was the best land we could find. The food for the men consists of *farinha* and rice, and mine is a cup of condensed milk. The river has nothing for us to eat. Fortunately this afternoon everything changed. The banks of the river ceased to be covered with water. The river is broader, and we succeeded in killing two *cojubins* for dinner. We found a field formerly cultivated by the Indians and, behind this, a large cultivated field of manioc still green; the field extends to the bank of the river and to an affluent six meters broad. These fields are usually on the left bank of the Ananáz and have been made with implements given the Indians by Colonel Rondon.

At about 10 o'clock we passed other formerly cultivated fields where there exist signs of the stone ax in some places both on the left and right bank of the river. I left a bench mark at the place where I finished the survey.

April 9. Today is my birthday. I imagine how much they are thinking about me at home. Oh that I were in the bosom of my family! Alone here, without a friend, without a person with whom to converse

or exchange ideas! I am going down this river without knowing, with certainty, where I shall arrive. Here in this wilderness, where one does not see a living being, my mind, from early this morning, has been filled with thoughts of all those that are dear to me. When shall I be in Manáos?

We have not seen a single sign of an Indian during the whole day. We are probably, therefore, leaving behind us the Nhambiquaras, including the Taganantís, who told us that they would wait for me to give them my battle ax, my knife, etc. I pray God I may not meet another Indian and may not have to think of them. Only yesterday I was saying to myself in the hours of meditation: "The best gift that God could give me on my birthday would be the confluence of this river with the Roosevelt." But I have not lost courage yet. I have great hope of reaching that river. If I succeed, I shall be able to give myself a treat. The width of the river here is from 28 to 30 meters.

Shoals, Rapids, and Falls

At 4 o'clock in the afternoon we passed the first shoals in the river. Since 12:30 we have been realizing that we are approaching falls because we have seen, almost at the surface of the water, enormous rocks. Fortunately we passed all the rapids in the river without incident. On account of fallen trees the water runs rather rapidly.

The noise made by the water running against the trees was much like the roar of falls. At 4:15 we heard a noise like the roar of a great cataract. At 6 o'clock the existence of the cataract a little below was confirmed. I gave it the name of "The Ninth of April." The information given us by the Nhambiquaras was correct.

SOUTH AMERICAN ALLIANCES: SOME POLITICAL AND GEOGRAPHICAL CONSIDERATIONS

By OSGOOD HARDY

From the standpoint of international relations one of the most striking effects of the European War has been the ending of the Triple Alliance and the probable merging of the Triple Entente into the League of Nations or some organization akin to it. The decline in importance of these two great international *rapprochements* has been watched with interest throughout the civilized world—an interest so great that we have almost lost sight of the effect of the war on the most famous American *entente cordiale*, namely, the so-called A. B. C. Alliance of Argentina, Brazil, and Chile.

The A. B. C. Alliance

Before the war there was no small amount of discussion regarding its possibilities, and few writers on Latin American themes failed to give it considerable attention. During the war little was heard of it, and now that peace has come many are wondering if it will once more engross our attention. Thus far little has been heard of it although the newspapers of both Argentina and Brazil are advocating what is tantamount to an enlarged form of the A. B. C. Alliance which will include all the American republics; and they are declaring that a league of American nations should be formed before the South American republics enter the League of Nations as drawn up at Paris. It is to be expected that such discussions as these would take place; the only extraordinary feature is that in them there has been made no attempt to resurrect the A. B. C. Alliance. The questions therefore come to mind, "Is the A. B. C. a thing of the past, and, if so, why?"

In the opinion of the writer, the attempt to form an alliance of the A. B. C. Powers of South America is dead and will never be revived. In a few short years it has become as obsolete as that famous old alliance of more sacred name which called into being our national shibboleth, the Monroe Doctrine. Why it has become obsolete and why it will remain so, it is the purpose of this article to point out. The question will be discussed from both the political and the geographical standpoint.

Its Political Basis

The political basis of the A. B. C. Alliance was unquestionably the fear on the part of Argentina, Brazil, and Chile that when the United States

backed up the Monroe Doctrine and professed that it stood ready to defend the postulate "America for the Americans" it was really keeping its tongue in its cheek and meaning all the time "America for the North Americans." They saw us drive Spain from the New World, keeping Porto Rico for ourselves and retaining a controlling interest in the affairs of Cuba. When later we "took Panama" (to quote the words of our greatest American), they were very much inclined to believe that the "Colossus of the North" was to be feared by all the republics in the Southern Hemisphere. Accordingly Argentina and Chile, luxuriating in a spirit of friendliness which sprang up after they had settled their boundary disputes and had beaten several of their cannon into the "Christ of the Andes," got together with Brazil and formed what they hoped would be a powerful offset to the dominating influence of the United States.

In spite of its frankly anti-United States *motif* this movement was welcomed by many in this country. They felt that, if we could unite with the leading powers of South America, much of the burden of enforcing the Monroe Doctrine then resting on the United States could be shifted to them. Accordingly, when we were attempting to settle our troubles with the late Mr. Huerta of Mexico, representatives from Argentina, Brazil, and Chile were called into conference, and it was felt that a decided step had been taken towards the bringing into actual being of the A. B. C. Alliance.

The Effect of the War

The European War, however, not only put a quietus on operations for the time being but would seem also so to have changed the relative positions of the three powers concerned as to render a resumption of operations impossible. By its active entrance into the war, Brazil acquired an international position which is recognized with envy by the other two powers. Brazil was a signer of the Treaty of Peace and is a charter member of the League of Nations. The result is that the largest country in South America, because of its clean-cut stand against the Teutonic Powers, has received such recognition from the Allied Nations as gives it predominance in international affairs over both Argentina and Chile. At the same time a kindred desire on the part of both the United States and Brazil to continue the relationships engendered in fighting for a common cause has brought these two countries even more closely together today than in the times of the Emperor Dom Pedro, when our respect for the rising young nation to the south of us was signalized by the raising of the rank of our representative at Rio de Janeiro from minister to ambassador. No foreign statesman who has visited us in recent years has been received with greater acclaim and demonstrations of friendliness than was President Pessoa, and we believe it can be safely predicted that in the future Brazil will enter no alliance whose main *raison d'être* is hostility towards and fear of the United States.

Relations of Brazil and Chile

With the removal, as far as Brazil is concerned, of the foundation stone of the structure, the A. B. C. Alliance must fall. Only fear of an outside power ever brought Brazil into close relations with Argentina, for that country has long been Brazil's greatest rival, politically as well as economically. Although the two countries did combine successfully at one time for the purpose of overthrowing the tyrant López of Paraguay, their interests have been for the most part divergent rather than convergent. As for a friendship between Brazil and Chile, its only basis was a negative one. Not being contiguous they never had any boundary disputes; and, as both countries had extensive frontier litigations with Argentina, it was natural that their common hostility towards Argentina should bring them together. But later, when Argentina and Chile settled their troubles, this contributing cause was removed, and as Argentina and Chile became closer friends Brazil and Chile drifted apart. In fact, after the first Pan-American Scientific Congress, held at Santiago de Chile in 1908, Brazil's amity for Chile was somewhat cooled.

It is worth noting the occasion for this coolness, as it shows how really unimportant incidents may become factors in developing international ill feeling. At one of the most important sessions of the above-mentioned congress a leading Brazilian delegate gave a long and scholarly discourse. Unfortunately it was in Portuguese and consequently was understood by very few of the delegates. By reason of this and its lengthiness—for even Latin American politeness weakened under the strain of attempting to give careful attention to a long address which could not be understood—little attention was paid to it. Furthermore, the reporters did not give it much space in the papers of the following day. The result was that the Brazilian delegation was with difficulty prevented from withdrawing then and there.

Possibility of an Anti-United States Alliance

Chile, in consequence of several incidents in which our representatives preferred high-handed Yankee directness to diplomatic *savoir faire*, has been for the past generation the most anti-American of all the South American republics. If she, then, is to bring about the formation of an alliance for the purpose of combating the influence of the United States in Latin America it is certain she must look elsewhere than to Brazil for support. Furthermore, it is doubtful if Argentina would welcome any such advances. She realized that in supporting Germany she had placed her money on the wrong horse, and the frantic haste with which her Government accepted the invitation to become a member of the League of Nations and thereby swallowed whole the article which supposedly gives the support of the League to the Monroe Doctrine, would seem to indicate that Argentina, like Brazil, has outgrown her childish fear of us.

The only possibility of an anti-American alliance would seem to be, therefore, an alliance of Chile, Colombia, and Ecuador, and possibly Venezuela. As to the situation in Venezuela we know little, for President Gomez is exercising such a tight censorship that, politically speaking, our knowledge of darkest Africa before the explorations of Livingstone was encyclopedic compared with what we now know of the Venezuelan attitude towards international affairs. The traditional attitude of that country is of course anti-United States, although it is to be hoped that our enlarged commercial relations with her during the last five years may have dispelled a considerable amount of that hostility.

In regard to both Colombia and Ecuador it is also to be expected that the future will bring about a more friendly attitude towards the United States. Since the acquisition of independence by Panama the former country has naturally felt somewhat aggrieved. This feeling, however, has lessened in recent years; and, if the treaty which proposes to give her a $25,000,000 balm for her injuries is passed by the Senate, her wounds will undoubtedly be healed, especially as she is desirous of securing capital from the United States for the construction and extension of several essential railroads. Ecuador's hostility towards the United States is a relic of the days when Archer Harman's Guayaquil and Quito Railway Company refused to arrange its train schedules to meet the whims of Quito politicians, and it was not in any degree lessened during the period of canal construction when ships from Guayaquil to Panama were quarantined on account of the execrable sanitary conditions of the former port. In the last two years, however, the Ecuadorians have seen the light. General Gorgas was invited to clean up the "pest hole of the Pacific," and he did such an excellent piece of work that not only do ships now dare to stop at Guayaquil on their way northward, but the respect and thanks of the Ecuadorians themselves were accorded him.

Suggested Alliance of Colombia, Ecuador, Chile

At the same time it must be noted that the Ecuadorian press is seriously discussing the question of an alliance of Colombia, Ecuador, and Chile. One distinguished writer and diplomat has come out in the columns of *El Tiempo* of Quito with the plain statement that a union of these three South American republics is absolutely necessary. The reasons for this alliance the author of the article does not delineate clearly. They are, however, not difficult to supply. Both Brazil and Peru have claimed large parts of the Ecuadorian *montaña*, and the moral and material support of Chile would be of great aid to Ecuador in preventing the dismemberment of her trans-Andean hinterland. But it is of little importance what may be the reasons underlying this discussion; the fact remains that it is a straw which shows that the wind is blowing directly away from the A. B. C. Alliance.

Geographical Reasons Against a Revival of the A. B. C. Alliance

We believe, therefore, that we are safe in saying that there is no longer any diplomatic basis for an alliance of the A. B. C. Powers. With the disappearance of its diplomatic *raison d'être* that alliance cannot be resurrected, for it never had any geographical reason for existence. Chile is pre-eminently a mining country, and the purchasers of its raw materials are to be found entirely outside of South America. The temperate regions in south-central Chile, with proper development, can provide her with all the cereal and meat products she needs for her own consumption and thus make her independent of Peru and Argentina; while Colombia and Ecuador, if the efforts now being made by Chile to increase commercial relations with those countries prove successful, will provide her with all the tropical foodstuffs she requires. Isolated from the rest of South America by the gigantic barrier of the Andes, Chile is by natural conditions constrained to go her way alone. Blest with an invigorating climate, which has enabled the mixture of European immigrants with the strong Araucanian native stock to retain all its inherent virility, she has developed her army and navy to such a point that she little needs the aid of any other South American country.

Geographically Argentina has more in common with Paraguay and Uruguay than with any other parts of South America, and it would seem as if their common economic interests would draw these countries together. Such a union would certainly be advantageous to Paraguay, for her only navigable outlet to the Atlantic is the Paraná River, both banks of which in its lower course are in Argentina. Uruguay in its early history acted as a sort of buffer state between Argentina and Brazil, and attempts have been made by both these countries to include it within their boundaries. Its independence is now unquestioned; but the influence of a common language and common traditions and culture will naturally cause it to be more closely united with Argentina than with Brazil.

The Strength of Brazil

Brazil, on the other hand, in addition to being the political rival of Argentina, will in the future be its greatest economic competitor. Brazil has come to realize that the policy of carrying all its eggs in one basket, or at most in two, is dangerous in the extreme. Rubber and coffee have been, in the past, its two chief products. The rise of the East Indian cultivated rubber industry has shown that the days of Brazil's caoutchouc wealth are numbered; while increased sales of coffee by the Caribbean countries to the United States, long Brazil's chief customer, have convinced many Brazilian economists that the future wealth of their country depends on the development of the cereal and live stock regions in the southern states of Rio Grande do Sul, Santa Catharina, and Paraná. One very

important effect of the European War was the great impetus it gave to the diversification of Brazilian industries. The development of that part of Brazil which most closely resembles Argentina and Uruguay has made and excellent start. As these states become important Brazil will more and more become a competitor of the River Plate countries. This competition, added to the political rivalry between the two countries, both of which aspire to be the leading nation of the Southern Hemisphere—a rivalry accentuated by the absolutely divergent attitudes towards the European War—will cause Brazil to turn to some other country rather than to Argentina if she desires to form alliances in South America.

Possible Alliance of Peru with Brazil

As to which country she would join, only a conjecture can be made, but it seems logical to think that it would be Peru. An alliance with Brazil would in all probability be welcomed with open arms by Peru, for the two countries have much in common. Both have at all times been on very friendly terms with the United States. From the beginning of the European War Peru was also strongly pro-Ally and, although she never actually entered the war, broke off diplomatic relations with Germany and was far from feeling the benevolent neutrality towards the Teutonic Powers maintained by Chile and Argentina. The boundary troubles between Brazil and Peru have been equitably settled, and the common interests between the *montaña* of Peru and its natural outlet, the Amazon Basin of Brazil, will naturally be a factor in bringing about a closer relationship. Finally, Peru is naturally possessed of an undying hatred for Chile, and she needs the moral and material support of her strong neighbor if she is ever to secure the return of her "Alsace-Lorraine."

Participation of Bolivia

In any such *entente cordiale* between Peru and Brazil, Bolivia would in all probability be a participant also. Before the war it seemed as if she had resigned herself to the inevitable and, with the completion of the Arica Railroad by Chile, had settled down to a policy of receiving with thanks any favors which Chile, her conqueror in the War of the Pacific, might see fit to dispense. Today all is changed. The statements of Mr. Wilson regarding the rights of small nations and his friendly attitude towards the agitation of the Czecho-Slovaks regarding an ocean outlet revived the long dormant hopes of the Bolivians for a port on the Pacific. Their demand, when placed before the Peace Conference, received no attention; but, in spite of this damper, a heated political controversy is now in progress, one party to which, under the leadership of ex-President Montes, is urging that the Government seek the immediate concession of a seaport. As Peru is attempting to secure the taking (under conditions that would

assure her the victory) of the long overdue plebiscite to determine the ownership of Tacna and Arica, she would welcome Bolivia's presence in any alliance with Brazil.

Conclusion

In the opinion of the writer, therefore, it seems improbable that the defunct alliance of the A. B. C. Powers of South America will be resurrected. There is neither diplomatic nor geographical reason for its revival. On the contrary, it is predicted that the future will see three diplomatic understandings, if not alliances, in the Southern Hemisphere. In the center of the continent, and predominant, will be a union of interests between Brazil, Peru, and Bolivia. South of that Argentina, Uruguay, and Paraguay will tend to merge their interests. The third group will be made up of Chile, Colombia, and Ecuador.

From the standpoint of our interests in South America such a grouping would be decidedly advantageous. The central trio is already friendly towards us. The River Plate countries are finding the United States an increasingly profitable market with which to trade, and it should be an easy matter for us to win their friendship. The third group of republics is frankly suspicious of us; but Colombia and Ecuador are becoming less so, and, if we can refrain from mixing in the Tacna-Arica question, there is little doubt that time will dissipate the unpleasant memories of the *Itata*, *Baltimore*, and Alsop incidents and make it possible for us to secure the regard of the one country whose people, in our attempts to flatter, we have often called "the Yankees of South America."

PASSARGE'S PRINCIPLES OF LANDSCAPE DESCRIPTION

By W. M. DAVIS

Dr. Siegfried Passarge, known fifteen years ago for his explorations in South Africa, where he came upon the important idea of "leveling without base-leveling," and subsequently professor of geography at the University of Hamburg, has frequently urged the importance of carefully studying the facts of the visible landscape before attempting to explain them. He now makes practical application of this manifest principle in a textbook, "Beschreibende Landschaftskunde," the first part of a contemplated four-volume work, "Die Grundlagen der Landschaftskunde," which is as a whole intended to serve as a guide to the investigation and description of the visible features of geographical areas in their natural combinations. It is well said in the introduction to the first volume, now issued,[1] that the study of the visible landscape is a branch of geography which has at last secured the place it should have long since occupied; for a knowledge of geographical spaces and their contents is the indispensable foundation on which all geographical descriptions and generalizations must be built; and it is furthermore held to be a scientific necessity that the study of landscapes, including their land forms, atmospheric effects, plants, animals, and human inhabitants, as they are actually seen to occur together, should begin with an empirical description of facts of observation, uninfluenced by theoretical or explanatory preconceptions. The volume before us aims to assure the accomplishment of this empirical task.

Systematic Analysis of Landscapes

The first 15 pages present a systematic analysis of landscapes (*planvolle Landschaftszergliederung*), which is intended to aid the observer towards thorough work by compactly listing the many kinds of features of which landscapes may be composed. Thus atmospheric effects are allowed 76 headings; land forms, together with streams, lakes, and shore lines, several hundred; plants, animals, and man are treated with similar liberality. As examples, under the relation of lakes to rivers, we find *Blindseen, Quellseen, Endseen, Durchgangsseen, Hochflutseen, Haffe, Limane, Deltaseen;* under cliff coasts, *Hohlkehle, Grotten, Höhlen, Tore, Kliffkanäle, Kliffdolinen, Kliffnischen, Strandstufen, hängende Täler, Felsenstrand, Felsenwatt;* under plan of settlements, *Einzelhöfe, Einzelgehöftdörfer, Haufendörfer, Runddörfer, Strassendörfer, Kettendörfer,*

[1] Siegfried Passarge: Die Grundlagen der Landschaftskunde: Ein Lehrbuch und eine Anleitung zu landschaftskundlicher Forschung und Darstellung. Band I. Beschreibende Landschaftskunde. 210 pp.; diagrs., ills. L. Friederichsen & Co., Hamburg, 1919.

Festungsdörfer, Waldinseldörfer, Festungen, Burgen, befestigte Gemarkungen. It is not to be doubted that these lists will aid the otherwise untrained traveler in making thorough notes, for few travelers possess either a good enough power of observation to recognize or a sufficiently extended vocabulary to name the manifold features that they encounter.

Description of Visible Landscape Features: Land Forms

The meaning of the terms listed in Part I is explained in Part II, "Beschreibende Landschaftskunde," which occupies three-quarters of the book. The method here adopted may be illustrated by the treatment of land forms. These fundamental features are first classed as individual and as composite forms (*Grundformen und Gruppenformen*). The individual forms are mountains, valleys, plains, etc., each of which is composed of certain elements that cannot exist alone; thus a mountain has a summit, slopes, and base; a valley has sides, floor, and river channel. Composite forms, such as mountain ranges, are made up of many individual peaks, domes, and ridges; and composite forms are associated in larger regions and zones. The classification is thorough, sometimes to the point of being labored, as is indicated by the three lists of terms given above. The variety of forms treated is great, and a knowledge of them is profitable; but, as might be expected in any such text, certain items of equal rank with those included are not mentioned. Among omitted items are: the varied forms of spurs in incised meandering valleys, the frequently occurring "underfit" relation of stream curves to incised-valley curves, the cusps and concaves of terrace fronts, the upstream breaking of standing waves in rushing torrents, the prevalently discordant junction of small and large stream beds, the daily length-variations of mountain-ravine streams in arid regions, the reflection of waves from partly submerged cliff faces, the refraction of surf so that it arrives on beaches nearly coincident with their curves, the relation of beach detritus to the rock floor on which it usually lies, the peculiar behavior of 'long-shore tidal currents with relation to high and low water, the color of sea water on coral-reef flats. It is not so much the number as the significance of these omitted items that is striking.

Avoidance of Explanatory Terms

The effort to avoid explanatory terms and to limit the definitions and descriptions of individual forms to empirical statements is remarkably successful, although it evidently involves the suppression of elementary explanations that are perfectly familiar to the author, for they are well established and universally accepted. The names given to individual and composite forms are also in nearly every case free from explanatory implication, although this cannot be said of *Durchbruchstal* and *Vulkan*. Many names, like *Ringwallwasserscheide, Zwischengebirgstäler,* and *Fluss-*

mündungsküste, are compounded in a manner to which the German language lends itself with exceptional facility. Yet, in spite of the intention to give purely empirical definitions, explanatory inferences creep in here and there and clearly carry the brief descriptions beyond the narrow limits of direct observation. For example, *zerplatzte Felsblöcke* is the phrase applied to the severed parts of a weathered boulder, although its splitting is inferred and not seen. Mountain torrents are said to lay down their detritus in fans where they enter a main valley, although even if an observer happens actually to see a small volume of detritus thus deposited, it is only by inference that he knows the entire fan to be of similar origin. Flood plains are said to show various signs of past and hence inferred flood action, such as deposits of sand and gravel, or old and fresh stream channels. The diagram of a longitudinal valley-terrace includes a foreground section in block-diagram style, in which valley-floor alluvium is drawn as lying upon an inferred underground extension of the valley sides. Likewise, the block diagrams of certain concentrically grouped ridges of oval ground plan, to which the names of *Kragenberg* and *Kragenwallberg* are given, show in their frontal sections that the ridges are the surface expression of inferred but invisible underground structures of anticlinal and synclinal arrangement. The distributaries of a river on a delta are said to flow between self-made levees. Marshy coasts are said to be formed where rivers deposit their sediments, although deltas are not similarly explained. Cliff-foot caves are said to be excavated by the surf, although gorges are not ascribed to stream erosion. A gravel-covered bench in a sea-facing cliff is named *gehobene Strandstufe,* yet embayed coasts are not explained by the submergence of valleys. "Islands become land-tied, bays are filled up." As to coral reefs, "one gains the impression that a high island sinks and its fringing reef survives as a smaller atoll, or its barrier reef as a larger one;" and the sections by which fringing and barrier reefs are illustrated show the extension of an inferred foundation slope from the island beneath the reef.

In the chapter on man, inferences as to the reasons by which the location of villages has been determined are frequently suggested; indeed, although the treatment professes to be purely descriptive, human settlements are explicitly said to be usually determined by such factors as soil, water, or plant growth, thus indicating the recognition of a highly reasonable explanatory preconception as to cause-and-effect relations; yet such causal relations clearly lie beyond the reach of direct observation, in so far as they concern the reason for the location of a village. Furthermore, certain villages in peculiar situations, difficult of access, are called refuge villages; towns on the higher bank of a stream were placed there to avoid overflow during floods; river fords and bridgeable narrows are treated as frequent causes of village or city location; a special explanation is given for the peculiar location of some small settlements away from the springs of an

arid region (p. 148); and a socialistic extension of observation into prediction is found in the statement: "Factories are like bombs with time fuses. . . . When industrialism prevails, it sooner or later leads irremediably to disaster."

These failures to present purely empirical definitions and descriptions illustrate the natural and constantly increasing habit of treating geographical matters rationally in these modern days of evolutionary philosophy; but they form so small a part of the text that they do not seriously lessen the value of Passarge's book as an empirical "Beschreibende Landschaftskunde." As has been said, a knowledge of all the features here described would be of great value to every geographer, and especially to the traveler who, untrained in geography, nevertheless wishes to make some record of his geographical observations.

The Outline Illustrations

The meaning of a good number of the terms is made clearer by small figures in the text, among which those illustrating different kinds of human settlements are to be particularly commended, as most of them seem to be copied from authentic pictures of actual examples. Unfortunately the same cannot be said of the small figures of land forms, reproduced from drawings by Passarge's laboratory assistant; many of them are seriously inadequate, in that they are not accurate representations of actual *Grundformen* taken from existing landscapes but are roughly drawn ideal figures, many of their lines being inexpressive to the point of inaccuracy. Some of the illustrations are mere profiles which, as in certain instances already noted, not only depart from the plan of the book by showing inferences concerning invisible underground structures but also fail fully to realize the object of the book by not giving its readers good presentations of surface facts. Such bare profiles may serve to summarize the impressions of an observer who has seen the facts out of doors, but they do not suffice as indoor reproductions for students who have not seen the facts. Other illustrations are schematic diagrams, which appear to have been designed by an artist inexperienced in sketching the original objects rather than to have been drawn from nature by a skillful and critical observer. The volume of a river in a narrow and steep-sided mountain valley is enormously exaggerated; flood-plain scrolls, inappropriately named *Halbmonde*, are not shown in their characteristic pattern; the scrappy little marks intended to represent a talus-covered slope beneath a rocky knob are most inexpressive; two elongated table mountains are shown with flat tops and sharply defined rims, but they have no well-developed cliffs, by the upper edge of which alone their rims can be sharply defined; a cliff-rimmed mesa, or *Kranzberg*, has a thin cliff-making stratum at mid-height, correctly drawn on its left profile but incorrectly drawn on its right profile. Empirical descriptions may, of course, be based on these inadequate drawings if

desired, but in a book that professes to hold closely to facts and that excludes all explanatory terms and rational descriptions, drawings so rough, not to say misleading, as some of these are seem out of place.

Descriptions of Actual Land Areas

The last 35 pages of the book are occupied by a supplement, containing nearly eighty empirical descriptions of actual land areas, intended to serve as examples for imitation. Over fifty of these descriptions are based on Baedeker maps; about twenty more are prepared from pictures, some of which are cited in certain books of travel, while others are here given in plates at the end of the text. One of these views, a drawing from a model of the Mont Blanc group, is seriously wrong in failing to show the strong discordance of levels between the hanging side trough of the Mer de Glace and the overdeepened main trough of Chamonix. It is interesting to note that in a number of these empirical descriptions, Passarge guards some of his statements of fact by qualifying them with *"anscheinend"* or *"augenscheinlich,"* just as geographers who prefer explanatory descriptions use similar words to indicate doubt as to the explanations they propose. Some of the descriptions extend, apparently by inference, beyond the facts shown in the pictures; as in making mention of *Sand* on an arid plain, and of *Schutt* on a distant mountain slope. Preconceptions are occasionally implied, as in the use of *zerschnitten* in describing mountain slopes, of *gerundet* instead of *rund* in describing a certain ridge crest, and of *einschneidend* in describing a certain valley. In general, however, the descriptions hold closely to the facts. One of the best examples (p. 170) is only 16 lines in length.

Über einer mässig steilen, zerschluchteten Buschwaldböschung erhebt sich eine schroffe, kahle, zerklüftete Felsenmauer als Gipfel des wohl +1000 *m* hohen Tafelberges, dessen Oberfläche eine von waldigen Randschluchten zerschnittene, wellige Grasflur bildet. Aus den Gehängeschluchten heraus entwickeln sich in der Ebene gewundene, steil eingeschnittene Galeriewaldflüsse, die von trockenen, grasigen Überschwemmungsflächen mit zerstreuten Palmen eingefasst werden. Zwischen den Flüssen erheben sich niedrige, gelblich-bräunliche Baumsavannen-Platten, die mit steilem Rand zu der grünen Überschwemmungssohle abfallen. Aus den emförmigen Flächen der Steppenplatten ragen die kahlen Rotlehmkegel der Termiten auf. Rundliche Buschwaldinseln erfüllen den Boden von flachen Sandpfannen, die hier und da eingesenkt sind. In der Überschwemmungs-Grasflur weiden Herden von Antilopen, deren Wechsel als schmale rote Linien die Savannenplatten durchziehen. Aus einer Schlucht des Berges aufsteigender Rauch verrät die Schlupfwinkel eines Stammes, der sich in die unzugängliche Fels- und Buschwildnis des Berges zurückgezogen hat.

This may well serve as a model, so vividly does it present a picture of the landscape it describes; and yet even this model contains light touches of explanation, for it suggests the inferred action of an inorganic process in using *"eingeschnitten"* to describe certain streams, and an inferred human motive in using *"zurückgezogen"* in telling of the nearly inaccessible refuge of a savage tribe. Without doubt the study of a moderate number

of such descriptions and the preparation of several more would be beneficial to all earnest students of geography; but it is hard to believe that the lesson to be thus learned is so difficult that the many sample descriptions here given are necessary.

The Volume as a University Textbook

The logic of Passarge's method is beyond dispute, and, as has already been pointed out, his present book must prove highly serviceable to travelers who do not profess to be geographers but wish to give some account of their travels. Such observers would be greatly aided by the introductory suggestions in the "Planvolle Landschaftszergliederung" and by the descriptive definitions in the body of the book. But that a book of this nature should be regarded as an essential foundation for university instruction in geography, especially for beginners, is quite another matter. The propriety of giving so much space to the empirical first step of university instruction in geography is pedagogically very questionable. No one disputes the necessity for abundant observational study of geographical facts. No one proposes to describe landscapes by substituting theoretical explanations for direct observation. Even those geographers who wish to replace empirical description by explanatory description as far as it is reasonably possible to do so, fully agree that, when an actual landscape is to be described, the observation of its features must come first and their description, of whatever kind, second. This is logically inevitable; but it by no means follows that the preparatory indoor study, which is for the most part non-observational, must be even in its introductory stage limited to empirical definitions and descriptions, from which all rational, explanatory treatment is excluded. It would be a most melancholy error if all inquiry as to cause should be repressed while a book of 210 pages is studied through. To what extent and by what method Passarge proposes eventually to use explanatory terms and descriptions will appear in the later parts of his four-volume work. In the meantime the first step of his procedure, as now presented, may be evaluated.

A high value unquestionably attaches to a knowledge of a large variety of empirically defined types and to the preparation of empirical records of directly observed facts; but in teaching university students it is by no means necessary to continue such exercises so far as Passarge's book demands before any explanatory description is permitted. Indeed, it may be well urged that, while a certain amount of indoor practice in empirical description from maps and pictures is useful, the best occasion for practice in the empirical description of observed facts is found during outdoor excursions, which should therefore be conducted slowly enough to allow time for deliberate sketching and description while the objects to be described are in sight. In contrast with these observational outdoor exercises, the greater share of indoor study may well be given to theoretical explanations, the

consideration of which should not be long delayed. Indeed, the postponement of explanation for so long a time as the use of Passarge's book would demand has no parallel in the teaching of other sciences. In geometry the many facts concerning points, lines, distances, surfaces, angles, areas, solids, and volumes are not all first defined empirically and afterwards reviewed with demonstrative explanations; rational treatment is from the beginning closely associated with definition. Any other procedure would be fatiguing and discouraging. Students of physics are not required to observe and describe a large variety of phenomena before any account of invisible theoretical matters is introduced. Observation, description, and explanation are closely associated in laboratory work, textbook study, and lectures, as the successive subdivisions of physics are learned.

Similarly a close association of rational explanation with observation and description is desirable in geography. Inquiries as to meaning and cause must inevitably arise during the presentation of a series of geographical facts to a class of right-minded, bright-minded young students; and it would be most unfortunate if the teacher should attempt to suppress such inquiry by announcing that all explanations must be postponed until the next semester. Inquiry as well as observation should be encouraged and utilized; for at the moment of inquiry the student mind is as ready for the reception of an explanation as a chemical element in the nascent state is ready to enter into a new combination. Reasonable care should of course be used as to the confidence with which the explanatory treatment of different landscape factors is introduced; but, as far as land forms are concerned, it would surely be unreasonably skeptical today to exclude mention of the work of weather and streams in the description of mountains and valleys, of submergence in the study of embayed coasts, of glacial erosion in telling about cirques and hanging valleys, of glacial deposition in telling about drumlins and till plains, and of various other explanatory processes in giving accounts of many well-understood landscape features. It is probable that zoögeographers and anthropogeographers would hold similar opinions as to the treatment of many problems concerning the well-understood organic elements of landscapes.

If a teacher, in attempting to carry out a dry logical plan, excludes all explanatory treatment for several months from so rationally treatable a subject as the geographical landscape, his students will outdistance him, especially if they have already had an introduction to rational geography before entering upon their university studies; for unless they are an exceptionally dull lot, their inquiring minds will spontaneously refuse to be stifled: if their teacher will not discuss explanations with them, they will discuss explanations with one another.

A textbook that imposes upon those who use it a prolonged empirical treatment, from which all the refreshing juice of explanation has been squeezed out, has a savor of heavy laboriousness. Such a book, unless in

the hands of an experienced explorer who could not refrain from now and then adding an invigorating flavor of explanation, would make dull grinds out of its students and exacting Gradgrinds out of its teachers. It is difficult to understand how its arid method can be advocated by a man so experienced in exploration and so expert in explanation as Passarge.

How different were the educational principles of Gilbert, our American master of geomorphology! He thought that the important thing in education is to train scientists rather than to teach science and that "the practical questions for the teacher are whether it is possible by training to improve the guessing faculty and, if so, how is it to be done:" he furthermore believed that the content of a science is often presented so abundantly as to obstruct the communication of its essence and that the teacher "will do better to contract the phenomenal and to enlarge the logical side of his subject, so as to dwell on the philosophy of the science rather than on its material."

It would be imprudent to predict how far German professors and German students of geography will be content to accept so tediously prolonged an empirical introduction to their science as the "Beschreibende Landschaftskunde" imposes; but, except that it may have a certain value as a work of reference in association with texts of an explanatory nature, a book of this kind is not likely to be used in the United States.

GEOGRAPHICAL RECORD

AMERICAN GEOGRAPHICAL SOCIETY

Roosevelt Geographical Exhibit. From October 18 to October 26 the American Geographical Society, in co-operation with the Roosevelt Memorial Association, held an exhibit dealing with Colonel Roosevelt's geographical activities. There were shown the official map of the "River of Doubt," autograph unpublished letters of Colonel Roosevelt and Colonel Rondon, his Brazilian associate, throwing light on his exploration of the river, and other material relating to his South American and African expeditions. Replicas of the gold medals awarded to Colonel Roosevelt and Colonel Rondon by the American Geographical Society were also on view, as well as the autograph copy of Colonel Roosevelt's address to the Society (see the *Review* for April, 1917) at the time of the award—just before the entry of the United States into the war—which ends with the passage: "We must put service first—not safety first; and we must act with that lofty and noble idealism which expends itself, not in empty words, but in action which recognizes the elemental fact that those men only are fit to live who are not afraid to die."

NORTH AMERICA

The Culture of the Southern States. Some of the recent writings of Dr. Roland M. Harper may serve as an antidote to the self-satisfaction which the Northern States are apt to feel because of their obvious achievements in certain lines of material effort. Whether they agree with him or not, geographers ought at least to think the matter over when he presents statistics which seem to him, for example, to show that illiteracy "is not such a menace as some persons seem to think. . . . Perhaps the ideal state of civilization would be to have about 6 per cent of the adult population illiterate and about the same number college graduates, and the rest distributed uniformly through the intermediate grades" (Illiteracy in Alabama: Where and Why, *Montgomery (Ala.) Advertiser*, June 1, 1919). Again: "Some Northern writers who know so little about the South that they are prejudiced against it claim that the presence of an inferior race in large numbers is bound to lower the standards of the dominant race; but I have recently worked out some statistics that show exactly the opposite tendency. . . . . Where negroes are most numerous the whites are most prosperous and cultured" (High Living Standards in "Black" Counties in the Southeastern United States, *Montgomery Advertiser*, March 28, 1919). In still another paper (The Distribution of Illiteracy in Georgia and Its Significance, *High School Quarterly*, Athens, Ga., Vol. 7, 1919, pp. 254-262) Harper advances the idea that compulsory education is the cause of the undeniably great amount of illiteracy in some of the manufacturing cities of the North. "Compulsory education . . . . tends to create a vacuum at the bottom of the industrial scale, which can be filled in part by using child labor, or better by importing immigrants old enough to be exempt from the education laws, from states or countries that have no such laws."

It would be easy to criticize these statements, but there is no denying the value and interest of certain facts which lie back of them. For example, in Alabama, Mississippi, and Louisiana the nine counties—or parishes as they are called in Louisiana—which have the greatest percentage of negroes rank at the very top in the value of the farm buildings of the few whites, while the number of white children who go to college is also above the general average. This illustrates a general and striking fact, which Harper brings out clearly: "Not only in Georgia, but also in other Southeastern States, where negroes are most numerous the contrast between the two races in education is greatest." This does not mean merely that the negroes in such isolated regions are ignorant because of their isolation from the white man but that the few whites are above the average for that part of the country in education and wealth. It means also, although Harper does not say it, that in such regions the social demarcation between white and colored, and also the contrast in the amount of land per individual, are at a maximum. There more than elsewhere the whites still own and control the land and presumably are above the average in inherited ability. Other whites of lower grade do not come because there is

little land for sale and because they do not care to compete with the negroes. Equally interesting are Harper's figures as to the well-known but not well-appreciated fact that where colored people are in the minority they tend to congregate in the towns and cities, while when whites are in a minority they, too, do likewise.

Much of Dr. Harper's effort is directed toward an attempt to prove that the climate of the South has nothing to do with illiteracy. To this end he gives figures for the different natural regions which he has worked out in Alabama and Georgia. Thereby he proves that the local distribution of illiteracy depends upon the relative isolation of large parts of the Southern States, the comparative sparsity of population, the small proportion of urban inhabitants, the comparative lack of wealth, and the slight amount of travel except in Florida, which is more literate than its neighbors. All this is excellent, but it proves nothing about climate, for nothing is said as to the possible relation between these other factors and the climatic factor. What it does prove is the extreme diversity of the various geographic controls which determine the degree of illiteracy. It also throws a valuable light on the geography of the Southeastern States, and it is to be hoped that Dr. Harper will continue to act as their geographic champion and gather his scattered observations into a single publication.

ELLSWORTH HUNTINGTON

AFRICA

Commercial Possibilities in the Salvage Islands. The Salvage Islands claim their share of wartime romance. A group of rocky islets lying midway between Madeira and the Canaries, they have heretofore been of little interest. No permanent habitation has been made on them because of the lack of a permanent water supply. Myriads of sea birds breed there, and the surrounding waters are excellent fishing grounds. Temporary occupation has been effected by a birding and fishing company. The company sustained losses during the war through the submarine campaign that preyed so effectively on Canary Islands shipping. It was suspected, though not proved, that the submarines had a base in one of the islets. Compensation, however, came when the company "literally struck oil in the shape of the puffins." From the sale of oil and feathers collected in a few weeks the sum of $20,000 was realized (*The African World*, London, July 26, 1919, p. 480). This is said to be the beginning of more extensive operations, and it is also suggested that the islets may yield guano deposits of commercial value.

AUSTRALASIA AND OCEANIA

Hawaiian Mean Annual Rainfall a New World Record. In connection with high-level hydrometric work in the Hawaiian Islands, engineers of the U. S. Geological Survey have found it necessary to measure the rainfall at several places at elevations up to over 5,000 feet above sea level. The records so far obtained show that Cherrapunji, the famous station in the Khasi Hills of India, whose mean annual rainfall is given as 426 inches, has a rival in Mt. Waialeale, altitude 5,080 feet, on the island of Kauai, as reported by G. K. Larrison of the U. S. Geological Survey in the *Monthly Weather Review* (Vol. 47, 1919, pp. 303-305). During a recent period with a somewhat broken record covering nearly five years between 1911 and 1917, Mt. Waialeale averaged 476 inches of rainfall annually. In this period the total precipitation on 1,782 consecutive days was 2,325 inches, or a daily average of 1.30 inches. On account of the difficulty of access the station has unfortunately been discontinued. Other stations in the islands have also given remarkable heavy rainfalls, amounting, in single years, to 562 inches in one case and 504 inches in another. The maximum daily rainfall thus far recorded was 31.95 inches at Honomu, Hawaii, elevation 1,200 feet (February 20, 1918).

The Hawaiian Islands have long furnished "stock" examples of great contrasts in rainfall amounts at stations separated by but a few miles of distance but differing considerably in altitude and in exposure. Starting with Mt. Waialeale, with a mean annual precipitation of 476 inches, the following records, covering practically the same period, are now available.

	ELEVATION IN FEET	RELATIVE POSITION IN MILES	ANNUAL RAINFALL IN INCHES
Mt. Waialeale	5,080	.....	476
Olokele	2,100	2.0 S.W.	149
Kokee	3,550	10.5 N.W.	56
Pali Trail	850	11.0 S.W.	16
North Wailua	650	4.0 E.	126

On the island of Maui the variations are still more remarkable. Stations near Puu Kukui, elevation 5,000 feet, with a mean of 369 inches (562 inches for 1918), give the following records:

	Elevation in Feet	Relative Position in Miles	Annual Rainfall in Inches
Puu Kuki	5,000	.....	369
Kahoma Reservoir	2,000	4.0 W.	55
Kaanapali	12	7.5 N.W.	18
Wailuku village	390	5.5 S.E.	30

November, December, March, and April are usually the wettest months. The precipitation is "showery," heavy rains rarely lasting more than a few hours. On the high peaks the mornings are usually clear, and the afternoons and nights wet.

R. DeC. WARD

PHYSICAL GEOGRAPHY

Long-Range Weather Forecasting and Ocean Temperature. Long before the days of synoptic weather maps, the relation of current meteorological conditions to rising and falling pressure was known. Later, when daily weather maps were available for study, the control of the migratory areas of low and high barometer over wind and weather changes could be worked out in great detail, and modern forecasting, for short intervals of a day or two in advance, became possible. Finally, during the last decade or so, it has become clear that the general character of *seasonal* weather is largely determined by the more or less permanent "centers of action" of the atmosphere, i. e. the stationary low and high pressure areas which persist for months over continents and especially over the oceans. Thus the possibility of making long-range, or seasonal, weather forecasts has stimulated an intensive study of the controls, and the influences, of these great centers of action. To this discussion, Petterson, Meinardus, Petersen, Helland-Hansen, Nansen, and others have contributed.

In this country, Dr. Charles F. Brooks of the Weather Bureau has lately been giving attention to the same subjects (see also paper by Dr. G. F. McEwen reviewed in the July *Review*, p. 72). In a recent paper (*Monthly Weather Rev.*, Nov., 1918, pp. 510-512), Dr. Brooks asserts that if it is possible to forecast the distribution of surface water temperature a few weeks in advance, it may prove possible to forecast the general paths which will be followed by cyclones and anticyclones, and then, from the winds which will result, to make long-range forecasts of the general weather to be expected in any period. In the first place, departures from the normal of the temperatures of the ocean surface result almost wholly from variations in wind direction and velocity. This point has recently been made clear by Helland-Hansen and Nansen for the middle latitudes of the North Atlantic. Here the emphasis is laid on the importance of the wind *direction* control. In the tropics the control of sea surface temperatures is found in wind *velocity*, changes in direction being of little or no importance. A considerable plus departure of temperature, originating in the eastern Atlantic during a month of stormy trades, may be felt, eight to ten months later, off the western coast of Europe.

Secondly, the paths and the intensities of migratory cyclones and anticyclones are well known to be influenced, to a considerable extent, by the temperatures of the regions over which they travel. Thus J. Petersen has shown that the Iceland low moves to and fro between southern Greenland and the Norwegian Sea under the control of a changing distribution of water temperatures induced by its own winds.

Finally, if the probable position and intensity of the center of action can be predicted, the weather type which will result may also, in a general way, be forecast. Dr. Brooks notes that "an unusually warm Gulf Stream favors cold weather in the eastern United States, while a cool Gulf Stream favors warm weather." The unusually cold and snowy north and northeast winds which characterized the winter of 1915-16 in the Middle and North Atlantic States are ascribed to the unusually warm water which came through the Straits of Florida and, spreading over the Atlantic to the south and east of New England, produced very favorable conditions for cyclones in that region.

In the same number of the *Monthly Weather Review* possible applications to the North Pacific Region are briefly considered, and there is also an "open letter," by Professors W. E. Ritter and G. F. McEwen, on "Ocean Temperatures and Seasonal Weather in Southern California." Observations at La Jolla, Cal., show that in July-October, 1917, the ocean temperature averaged about 5°F. higher than for the same months of the preceding nine years and that the force of the northwest ocean wind for the same period was about 20 to 30 per cent below the average. These exceptional water and wind conditions were followed by exceptional winter weather. Hardly any rain fell till January, 1918, and precipitation as a whole was low for all of California.

R. DeC. WARD

HUMAN GEOGRAPHY

Natural Regions, Geographical Regions, Human Regions. The systems of classification of world regions are significant of the trend of modern geographical thought. It is nearly fifteen years since Herbertson raised a geographical landmark in his "Major Natural Regions." The subsequent trend has been signalized by Unstead in his paper "A Synthetic Method of Determining Geographical Regions" (*Geogr. Journ.*, Vol. 48, 1916). Herein he urges the delimitation of *geographical* regions, "taking into account the human equally with the physical factors." From the discussion following the paper it is, however, apparent that, while the importance of the human factor is appreciated, there is vagueness as to how the problem of interpreting it should be approached. More recently an interpretation has been offered by Dr. H. J. Fleure in "Régions humaines" (*Annales de Géographie*, May, 1917) and in a revision, "Human Regions," in the March, 1919, number of the *Scottish Geographical Magazine*. To appreciate this system of classification we must recall Dr. Fleure's conception of human geography, a conception to which attention has already been called in the *Review* (see Vol. 6, 1918, pp. 515-516). Preparatory to outlining the classification it will be well to quote a restatement of the fundamental idea. ". . . . the continuous interaction and interpenetration of man and environment and the cumulative alteration of both man and the earth with the unfolding of history. Anthropology, history, and geography are a trilogy to be torn asunder only with severe loss of truth and of value to mankind."

Following this exposition Dr. Fleure lays down the postulate that man's activities are directed toward the accomplishment of three essential functions, viz. "nutrition, reproduction, and the increase of well-being; or life, new life, and good life." The first two, "since without those a race would disappear," are at once discarded. The third function remains as a basis for distinctions between human communities. Regions are then classified according to the measure of the earth's response to man's efforts in the pursuit of well-being.

From the viewpoint of man's search after well-being the lands that yield small return even to excessive effort are classed as "Regions of Hunger." These are represented by desert and polar districts, where even the greatest exertions barely suffice to satisfy the stern demand for food. "Regions of Debilitation" are those where enervating equatorial heat and humidity combine with the never-tiring attack of tropical vegetation to check all progress beyond the securing of the mere necessities of life. These moist, warm lands of low latitudes are not the home of ease and effortless luxury but rather are regions of excessive difficulty.

"Regions of Increment" is the term used to designate those lands which encourage man and give a generous response to his efforts. Proper alternation of rain and sun is one of the chief factors in making them favorable for human occupation. Monsoonal lands and those that, like the Mediterranean countries, receive winter rain and summer sun are typical of this class. These Regions of Increment, while requiring effort on man's part, reward him with such liberality as to leave him a surplus of food and time. Hence he may devote a part of his energy toward obtaining the higher things of life. Here arts and sciences may thrive, and man early attains an advanced degree of culture. Increasing demands with the higher standards of living that accompany developing civilization have bereft some former Regions of Increment of their character as such, reducing them to lower categories.

Intermediate types are styled "Regions of Effort," where the initial task of subduing nature is great but the effort yields fruitful result, and "Regions of Difficulty," in which material fruits are likely to be small at best. In the former the natural resources must be exploited to the fullest extent, and the search for earth's treasures of field and mine brings returns that often surpass the yield in Regions of Increment. Northern France, the British Isles, Germany, and most of the United States are typical examples of the Regions of Effort, while Regions of Difficulty are found in the high valleys of temperate zones and on the plateaus with cold winters. In these latter regions little can be done toward cultivating the so-called "good life."

The age of industry has transformed certain regions of several different types into one which stands alone, especially as regards the activities of man. This is the "Industrialized Region," represented by the great manufacturing centers of the modern world, where machinery and finance, both on enormous scale, have modified man's relation to his environment.

The final type is "Regions of Wandering," where herding and hunting are the primary forms of human activity. The influence of such regions upon civilization has been out of all proportion to their sparse population or their scanty resources. Proud, thoughtful, reverent, with a bent toward trade, the nomads, in their wanderings, have spread learning, religion, and commerce in many directions from their undependable

pasture lands, thus contributing toward the "good life" of other districts, though their own lands are doomed to remain (save for the possible intervention of man's transforming genius) the temporary abode of vagrant tribes.

Regarding the classification two points remain for special comment. In this day of drawing of new boundaries they are points whose vital importance cannot be overemphasized. As Fawcett remarks in his able essay "Frontiers," the conception of frontiers as lines is purely subjective. It is convenient to establish a line boundary, but the actual bounds of human (as other) regions are *zones*, not *lines*. Here is a thought for political geography. On the largest scale considerable regions must be regarded as having a transitional character, and for this reason such regions are frequently of great import—the Paris Basin may be so considered as a transition between the Regions of Increment and Effort. In the second place the character of regions is liable to change. The modern Industrial Region is an example. Hydro-electrical development promises to transform certain Regions of Difficulty, and irrigation to redeem parts of the Regions of Wandering. Human relations must prepare for adjustment to transitions in time as well as in place.

Meteorology and Aviation. In the haste of preparation during the war most, if not at the start all, the teaching of meteorology at our military and naval aeronautical "ground schools" was given by men who had had no experience in flying. This was as inevitable as it was unfortunate. The instruction was naturally very largely theoretical and lacked the element of personal conviction and experience which would have done much to impress the essential facts upon the minds and memories of the young men who had enlisted in the air service.

Now that the war emergency is over and the development of peace-time commercial flying is rapidly gaining in importance, the next step is to match up the experience of the men who have actually done the flying with the theories, as these latter are now generally accepted among meteorologists. One of the earliest contributions to this discussion is that by Dr. Charles F. Brooks and others entitled "Effects of Winds and Other Weather Conditions on the Flight of Airplanes" (*Monthly Weather Rev.*, August, 1919, pp. 523-532). In this paper an attempt is made to explain on a scientific basis, for the benefit of the aviator, various meteorological phenomena which have actually been observed during the flying experience of numerous individuals. A further object is to bring together, from these experiences, a body of fact which will amplify, as well as clarify, the knowledge which meteorologists now possess regarding conditions in the free air. The special subjects dealt with are surface winds and local convectional currents, "turbulent wind boundaries," clouds and rain, thunderstorms, and air-density changes as affecting support. Several cloud pictures and a series of diagrams illustrate the article, the usefulness of which is further increased by the inclusion of a good working bibliography.

In the same number of the *Monthly Weather Review* there are additional papers on the same general subject: by C. L. Meisinger, "Balloon Race from Fort Omaha Through Thunderstorms" and "The Constant-Elevation Free-Balloon Flights from Fort Omaha"; and, by W. R. Gregg, "The Trans-Atlantic Flight of the British Dirigible *R 34*."

R. DEC. WARD

GEOGRAPHICAL NEWS

PERSONAL

THE DUKE OF THE ABRUZZI left Naples in October on an expedition to discover the sources of the Webi Shebeli River, which flows from Abyssinia through Italian Somaliland into the Indian Ocean.

PROFESSOR ELIOT BLACKWELDER in June resigned his position as professor of geology at the University of Illinois and since September has been devoting his time to geological research, especially regarding the history of the Rocky Mountains, with headquarters at Denver.

MR. CHARLES J. BLANCHARD of the U. S. Reclamation Service gave a series of three lectures in October and November entitled "The Northwest"; "Our Inland Empire"; "The New South." These were given in the system of public lectures conducted under the auspices of the Board of Education of the City of New York.

DR. LOUIS BLARINGHEM, professor of agricultural biology at the Sorbonne and exchange professor at Harvard University for 1918-19, gave a series of ten lectures in French in April and May on the condition and future of agriculture in France. The subject of the first lecture was "The Surface of France: Soils and Climatic Types."

MAJOR WILLIAM BOWIE, chief of the Division of Geodesy, U. S. Coast and Geodetic Survey, received the honorary degree of Doctor of Science at the commencement of Trinity College last June.

PROFESSOR J. C. BRANNER recently purchased the seismological library of Count F. de Montessus de Ballore, the eminent French seismologist, latterly director of the Seismological Service of Chile, and presented it to Stanford University. This is probably one of the most complete collections of seismological literature in existence.

DR. JAMES HENRY BREASTED, professor of Egyptology and Oriental history at the University of Chicago, spoke before the National Academy of Sciences at Washington on April 28 on "The Origin of Civilization—from the Old Stone Age to the Dawn of Civilization."

PROFESSOR J. W. CROOK of Amherst College gave a lecture on "Foreign Trade and Our New Merchant Marine" on October 31 in the system of public lectures given under the auspices of the Board of Education of the City of New York.

PROFESSOR JOVAN CVIJIĆ of the University of Belgrade was awarded the Médaille Gauthiot by the Société de Géographie Commerciale de Paris in recognition of his preeminent knowledge of Balkan geography, both physical and human, the most recent exposition of which is his admirable "La Péninsule Balkanique: Géographie Humaine."

PROFESSOR W. M. DAVIS was awarded the Patron's Medal of the Royal Geographical Society in June "for his eminence in the development of physical geography."

MR. FRANK DEBENHAM, a member of the scientific staff of Scott's last Antarctic expedition, has been appointed lecturer in surveying and cartography at Cambridge University.

MR. EDWARD J. FOYLES read a paper on "The Practical Use of War Maps at the Front" before the Section of Geology and Mineralogy of the New York Academy of Sciences on October 20.

MR. HOYT S. GALE of the U. S. Geological Survey, who spent several months investigating the potash resources of Europe for the Department of the Interior, made a study of the deposits of Alsace and of Stassfurt, Germany, during his stay abroad in 1919.

PROFESSOR PATRICK GEDDES has recently been appointed professor of sociology and civics in the University of Bombay. He has also undertaken to draw up plans for the restoration of the city of Jerusalem. Professor Geddes is the chief exponent of a movement in what may be termed geographical civics, the center of which is located in the so-called Outlook Tower at Edinburgh (cf. his article "Beginnings of a Survey of Edinburgh," *Scottish Geogr. Mag.*, Vol. 35, 1919, No. 8).

PROFESSOR MARK JEFFERSON gave a series of five lectures on the peace conference at the summer session of the State Normal College at Ypsilanti, Michigan. Professor Jefferson was chief of the Division of Geography of the American Commission to Negotiate Peace at Paris and representative of the United States on the commission of geographical experts of the Great Powers for the study of boundaries, from December, 1918, to July, 1919.

MR. H. J. MACKINDER, the eminent British geographer and member of Parliament, was in November appointed British High Commissioner for Southern Russia.

MR. F. E. MATTHES of the U. S. Geological Survey gave a series of lectures in the Yosemite National Park during July under the auspices of the University Extension Division of the University of California. The subjects were as follows: "Origin of Yosemite Valley as Indicated in the History of the Waterfalls"; "The Highest Ice Flood in the Yosemite Valley"; "The Origin of the Granite Domes of Yosemite."

MR. J. T. NICHOLS read a paper before the New York Academy of Sciences on May 12 on "The Relation of Ocean Currents to Fish Faunae in the Atlantic."

DR. FRANCIS ROLT-WHEELER, in the system of public lectures conducted under the auspices of the Board of Education of the City of New York, gave a number of lectures in October and November dealing with the activities of government bureaus. The bureaus discussed were the Geological Survey, Forest Service, Reclamation Service, Department of Agriculture, Department of the Interior, Indian Affairs Office, Bureau of Fisheries, Emigration Office, and Census Bureau.

PROFESSOR G. B. ROORBACH, recently of the University of Pennsylvania, has been appointed to fill the newly created chair of foreign trade at the Graduate School of Business Administration at Harvard University.

DR. J. N. ROSE of the National Museum, Washington, D. C., spoke before the Torrey Botanical Club on April 8 on "Botanical Explorations in Ecuador."

DR. H. J. SPINDEN of the American Museum of Natural History addressed the New York Academy of Sciences on April 21 on "The Eruption of a San Salvador Volcano, June 7, 1917."

MR. VILHJÁLMUR STEFÁNSSON was recently awarded the La Roquette gold medal of the Société de Géographie de Paris in recognition of discoveries made by the Canadian Arctic Expedition under his command during the years 1913-18.

GEOGRAPHICAL PUBLICATIONS

(Reviews and Titles of Books, Papers, and Maps)

For key to classification see "Explanatory Note" in Vol. II, pp. 77-81

ASIA

INDIA

CREAGH, O'MOORE. **Indian Studies.** 320 pp. Hutchinson & Co., London, 1918. 16s. 8½ x 5½.

This is a modest volume, without preface, dedication, introduction, map, or even index. The 17 chapters are most meagerly labeled, and the hasty reader is repelled by the little that is done to attract his attention and inflame a jaded curiosity. The book is characteristic of its author—soldier from boyhood, a doer of deeds rather than a maker of phrases, a blunt critic, a patriot who despises the traitor disguised as a friend of humanity. No one knows India better than General Creagh; no white man has lived there longer; and none experienced more varied fortunes amid her 400,000,000 souls of differing race and creed. From subaltern to commander in chief, the author has studied India at first hand and, now that he is in official retirement, has penned a precious legacy for the guidance of those about to experiment politically in this vast and complicated empire.

The name and rank of Sir O'Moore Creagh suggest involuntary comparison with Lord Roberts—a comparison useful only in so far as it draws attention to the high standard of personal talent and loyal service prevailing in the Indian army. Lord Roberts' book is about himself—primarily a biography and incidentally valuable as a guide in Far Eastern problems. Creagh's book takes each phase of British India seriatim, and we are left to guess regarding the author, who gives us no clue save the negative one by which every reader will recognize the hand of a morbidly modest writer.

The book treats of Hindus, Mussulmans, Sikhs, the India Office, local government, the land tax, the village, feudatory states, the army in India, and the British government and its dealings with India.

It is nine years since the reviewer was in Calcutta, but he well remembers that the name of Creagh evoked from native soldiers a loyal response, not to say reverence, that recalled such names as Lawrence and Nicholson. Let this indicate the degree of sympathy with which the author approaches his subject.

He has no academic prejudices or theories to apply. He knows the Sikh and the baboo, the Pathan, the Bengali and the warlike Mussulman of the north, the smooth banian, and the rapacious Brahman. He has little to say about native councils, or leagues of nations. He sees the need for honest and firm government by honest and firm administrators.

The Mesopotamia disaster is traced directly to the same pacifist policy that led the Third Napoleon to Sedan. "There was no co-ordination of work (p. 249) . . . . There were no plans of campaign worked out in time of peace; no mobilization arrangements were made until war was in sight; no useful intelligence regarding a probable enemy was collected . . . . The state of the army itself (in India) was due to a régime of pacifists who refused funds to keep it efficient and treated the repeated warnings of myself and my staff with scorn."

Here is enough to assure the reader that we have under consideration no smooth diplomatic apology for official incompetence but the indignant protest of a patriot who loves his country no less than he does India and who believes that she has the strength to throw off the red-tape leeches that are sucking her blood and that she will be the better for such an effort, even though he may personally be made a target for abuse by those whom he exposes in these pages. Aside from its great importance to students of administration, this volume is an arsenal of important notes, ethnological, geographical, sociological, and religious.

POULTNEY BIGELOW

HARWOOD, W. A. **A discussion of the anemographic observations recorded at Deesa from January 1879 to December 1904. A discussion of the anemographic observations recorded at Karachi from January 1873 to December 1894.** With an introduction by G. T. Walker. Diagrs. *Memoirs Indian Meteorol. Dept.*, Vol. 19, pp. 275-335. Calcutta, 1915.

Sir John Eliot, who was formerly at the head of the Meteorological Service of India, planned to write, after his retirement, a set of memoirs dealing with the wind records

at several Indian stations. His death prevented the completion of this work by himself, and Sir Gilbert Walker, the present Director General of Indian Observatories, has very wisely carried the series to completion, in the *Memoirs of the Indian Meteorological Department*. The present volume deals with the wind records for Deesa and Karachi, and was prepared by Mr. W. A. Harwood, Assistant Director of the Aerological Observatory at Agra. Sir John Eliot, however, left some notes for the Deesa investigation. Deesa is in latitude 24° 14′ N., longitude 72° 13′ E., and is situated on a sandy plain, extending eastward from the Rann of Cutch to the Aravalli Hills, about 60 miles from the Rann and over 200 miles from the open sea to the west of Cutch. The records cover the period January, 1879, to December, 1904. The year is divided into the three seasons characteristic of northern India viz. cool, hot, and rainy. Each season has its characteristic winds, and the data are considered under these three heads. In the cool season Deesa is within the zone affected by the "cold weather storms" of northern India, which come from Baluchistan and move eastward across the country.

Karachi is on the Sind coast at the extreme northwestern end of the Indus delta. The data cover the period January, 1873, to December, 1894. The three seasons are cool, hot, and monsoon. Three types of storms affect Karachi, viz. winter storms, moving eastward into India; monsoon storms moving westward from the Bay of Bengal; and storms of the transition periods, occasionally entering India from the Arabian Sea.

The discussion of the wind records is remarkably complete. The wind roses show very clearly the seasonal variation in wind direction at Deesa and the prevalence of winds from westerly and southerly points at Karachi, except in December and January. Many other diagrams are also included. This volume, like the long line of its predecessors, is in every way worthy of the splendid traditions of the Meteorological Department of India.

R. DEC. WARD

GOULDSBURY, C. E. **Tigerland: Reminiscences of forty years' sport and adventure in Bengal.** New edit. xvii and 262 pp.; ills. E. P. Dutton & Co., New York, 1916. $1.25. 8 x 5.

HAYDEN, H. H. **The mineral production of India during 1917.** *Records Geol. Survey of India*, Vol. 49, 1918, Part II, pp. 55-116. Calcutta.

MINCHINTON, H. D. **Himalayan scrambles in 1914.** Ills. *Alpine Journ.*, No. 214, Vol. 31, 1917, pp. 51-70. London.

QUEYROZ, FERNAÕ DE. **Conquista temporal e espiritual de Ceylaõ.** Introduction by P. E. Pieris. xxx and 994 pp. Government of Ceylon, Colombo, 1916. 10 x 6. [A reprint, from a manuscript copy purchased in 1844 from the Instituto Historico of Rio de Janeiro and now in the possession of the Government of Ceylon, of this fundamental source on the history of Ceylon, completed in 1687 by the author, then Provincial in the Society of Jesus.]

STUART, MURRAY. **Preliminary note on the Srimangal earthquake of July 8th, 1918.** Maps. *Records Geol. Survey of India*, Vol. 49, 1918, Part III, pp. 173-189. Calcutta.

YOUNGHUSBAND, FRANCIS. **Geographical work in India for this** [i. e. Royal Geographical] **Society.** Ills. *Geogr. Journ.*, Vol. 49, 1917, No. 6, pp. 401-418.

—— ***India and adjacent countries.*** 1:1,000,000. (1) Layered edit. and (2) political edit.: Sheets ***10, 17, 24, 29, 33, 39, 41, 43, 52, 53, 56, 58, part of 49, 62, 63, 64***; layered and shaded edition only: Sheet ***25***. Survey of India, Calcutta, 1915, 1916.

—— ***India, showing railways, open and under construction on 31-3-18.*** 1:4,055,040, or 1 in. to 64 miles. Survey of India. Calcutta, 1918. [Different gages and number of tracks shown by means of 11 symbols.]

—— [***Topographic map of India.***] 1:126,720. Sheets: ***43 B/S.W.; 43 B/S.E.; 43 C/S.E.; 47 M/N.W.; 47 M/N.E.; 47 M/S.E.; 49 M/N.E.; 49 N/N.E.; 53 B/S.E.; 53 H/N.W.; 53 H/S.E.; 55 M/S.E.; 56 A/S.W.; 58 A/S.W.; 58 A/N.W.; 58 A/N.E.; 73 B/S.W.; 92 G/S.E.; 92 H/S.E.; 92 H/S.W.; 92 H/N.W.*** Survey of India, Calcutta, 1916, 1917.

—— [***Topographic map of India.***] 1:253,440. Layered edit.: Sheets ***38N, Afghanistan and N.W. Frontier Province; 43D, Punjab; 84L, Burma; 92H, Burma.*** Political edit.: Sheets ***38N, Afghanistan and N.W. Frontier Province; 43C, Punjab and N.W. Frontier Province; 43D, Punjab; 84L, Burma; 92H, Burma.*** Survey of India, Calcutta, 1915, 1916.

AUSTRALASIA AND OCEANIA

Melanesia, Micronesia, Polynesia

Burgess, P. S. **A study of the principal plantation soil types as found on the Island of Hawaii.** 100 pp.; map, diagrs. *Rept. of Work of Exper. Sta. Hawaiian Sugar Planters' Assoc., Agric. and Chem. Ser. Bull. No. 45.* Honolulu, 1917.

Davis, W. M. **Les falaises et les récifs coralliens de Tahiti.** Diagrs. *Ann. de Géogr.*, No. 148-149, Vol. 27, 1918, pp. 241-284.

Fornander, Abraham, and T. G. Thrum. **The Hawaiians' account of the formation of their islands and origin of their race, with the traditions of their migrations, etc., as gathered from original sources.** (Fornander Collection of Hawaiian Antiquities and Folk-Lore.) iv and 228-503 pp. *Memoirs Bernice Pauahi Bishop Museum*, Vol. 5, Part II, pp. 228-503. Honolulu, 1919.

Foye, W. G. **Geological observations in Fiji.** 145 pp.; maps, diagrs., ills., bibliogr. *Proc. Amer. Acad. of Arts and Sci.*, Vol. 54, 1918, No. 1. (Shaler Memorial Ser.) Boston.

Hamrick, A. M. **Cumulus clouds of Hawaii.** Diagr., ills. *Monthly Weather Rev.*, Vol. 46, 1918, No. 9, pp. 415-417.

Repelin, J. **Sur un point de l'histoire de l'océan Pacifique.** *Comptes Rendus de l'Acad. des Sci. [de Paris]*, Vol. 168, 1919, No. 4, pp. 237-239. [The author believes that geological evidence points to the former existence of a continental land mass which included the Pacific islands from Fiji to the Low Archipelago.]

—— ***Hawaii.*** [1:250,000.] U. S. Coast and Geodetic Survey Chart No. 4115. Washington, D. C., Feb., 1919.

POLAR REGIONS

General

Greely, A. W. **Terrestrial life in Polar environments.** Ills. *Amer. Museum Journ.*, Vol. 17, 1917, No. 8, pp. 547-550.

Hassert, Kurt. **Die Polarforschung. Geschichte der Entdeckungsreisen zum Nord- und Südpol von den ältesten Zeiten bis zur Gegenwart.** (Ser. Aus Natur und Geisteswelt.) 3rd edit. 134 pp.; maps, index. B. G. Teubner, Leipzig, 1914. M. 1.25. 7½ x 5.

Hobbs, W. H. **The Ferrel doctrine of Polar calms and its disproof in recent observations.** *Proc. 2nd Pan American Sci. Congress, Dec. 27, 1915 to Jan. 8, 1916*, Vol. 2, Section 2: Astronomy, Meteorology, Seismology, pp. 179-189 (discussion, pp. 187-189). Washington, D. C., 1917. [Author's abstract is published in the *Monthly Weather Rev.*, Vol. 43, 1915, No. 12, p. 609.]

Tolmačev, J. P. **Notice sur la création de une [*sic*] commission polaire permanente.** *Bull. de l'Acad. Imp. des Sci. [de Pétrograd]*, Ser. 6, 1915, No. 6, pp. 467-481. [In Russian.]

Vernadskij, V. J. **Notice sur les buts de la commission polaire.** *Bull. de l'Acad. Imp. des Sci. [de Pétrograd]*, Ser. 6, 1915, No. 6, pp. 481-484. [In Russian: supplementary to the note by Tolmatchev, listed above.]

Arctic

De Geer, Gerard. **On the physiographical evolution of Spitzbergen.** Map, diagrs. *Geogr. Annaler*, Vol. 1, 1919, No. 2, pp. 161-192. Stockholm.

This paper is a valuable summary of a structurally and physiographically complicated region by an experienced observer; but the method of presentation is such that much work is left for the reader before he can clearly understand the writer's meaning. "Physiographical evolution" is here practically synonymous with "geographical evolution," in the special sense used by Sir Archibald Geikie in a famous lecture on Scotland some years ago; for both phrases mean the geological history of the physiographical features that the region has manifested through its long development. Hence, although both essays were published in geographical periodicals, the summary, like the lecture, contains much that is geographically irrelevant, except in so far as it may be useful for

geography, a present-day subject, to consider how far the processes and conditions of past ages were similar to those of the existing era.

The difficulty in reading De Geer's text is one that is frequently encountered in the geological treatment of physiographic problems. It arises chiefly from the failure to make explicit statement concerning the physiography of the land mass that was deformed and concerning the changes that took place upon it after deformation, at different stages in the region's history. The failure to make these statements does not appear to be so much because the past land forms of Spitsbergen are known to the author, as because he has not recognized their essential importance in a physiographic description. The essence of such a description is that it treats surface forms as well as underground structures. Hence, however full the understructure of a mass may be explained, its physiographic treatment is not complete until the form of its surface is indicated. For example, a "great flexure" is said to form the southern limit of the "northern oldland of Spitzbergen"; but the form of the thing that was flexed is not described; hence the flexure cannot be visualized as a physiographic element in the evolution of the region. Again, a "great horst," which forms part of the western coast and which is said to be of "very ancient origin," was upheaved at a later date; but in absence of all indications of its form at the time of upheaval, no clear concept can be gained as to the physiography of the upheaved area at that stage in Spitsbergen's evolution.

When the later stages of evolution are reached, the problem is less involved and more fully presented; and at the same time the problem becomes more geographic in its nature. Long-continued erosion resulted in the reduction of the region to a "base level" or peneplain in Cretaceous time; the peneplain was at least in part depressed and covered with 1200 meters of Tertiary strata; the compound mass was broken into blocks with roughly north-south trend in late Tertiary time, and the blocks were differentially displaced with moderate tilting; except that along the eastern border of the western horst, the Tertiary strata were strongly folded and faulted, the folds being adjusted to the great flexure of the northern oldland, which adjoins on the east, as "billows are to a shore." This is easily followed; but a lapse of explanation then happens; for, as is so often the case in the geological treatment of physiographic problems, practically no attention is given to the erosion by which the folded and faulted strata have been carved into their present form of sub-parallel ridges and valleys, although the accompanying sections show that an enormous volume of material must have been carried away in the reduction of the folded mass to its actual form.

The present altitude of the displaced peneplain blocks (whether formerly covered by Tertiaries and then stripped, or never covered, is not made clear) is indicated on the map by 200-meter contours and color tints, the greatest altitudes being 1200 meters. The contours are taken to represent fairly well the deformation that the region has suffered, on the reasonable assumption that the peneplain lay, before it was deformed, not much above sea level. Many of the blocks are gently tilted. Some are believed to have been warped into a convex surface: this is inferred because around the block margins, now much dissected by short fiord branches, the spurs here and there retain upland surfaces that are taken to represent the peneplain, although they are at significantly lower levels than those of the block axis. But it is recognized that it is not always possible "to know how much the present mountain tops have been lowered [by erosion] from the original base-level plain."

Spitsbergen is said to offer "unrivalled opportunities for fruitful and probably conclusive studies as to the origin of fjords." The last dislocations by which the Cretaceous peneplain "was broken and deformed . . . show undoubtedly . . . . a very close connection with the formation of the leading recent land forms [upland blocks and intermediate troughs] and especially with the main fjord and fjord-valleys." The head branches of Ice Fiord in particular exhibit deformed structures that prove the branches to be "determined by fissures and dislocations"; thus an intimate relation is found between "the mountain-making and the fjord-formation." Dissent must be expressed from this confident conclusion because, as in the account of the mountain ridges of folded Tertiary strata, the part played by erosion is not sufficiently considered. True, a paragraph on a later page, which opens with a repetition of the above conclusion: "It seems obvious that concerning the fjord- and valley-formation in Spitzbergen the late Tertiary dislocations and fissures played by far the most important rôle," closes with the supplementary statement: "It is evident that later erosion and finally the glaciers have given the last touch to the work:" but the very subordinate part thus ascribed to erosion by no means meets the facts as they are presented in the sections. Clearly, the structure of the region was given by the Tertiary dislocations; but the actual fiords, like the visible ridges of the folded Tertiary strata, are the work of erosion. The erosion appears to have been largely consequent upon the uneven form of the surface, as produced by the dislocations; but the fiords as physiographic features of today are

the products of an erosion so great that its measure should not be reduced to a "last touch," and its mention should not be relegated to a late paragraph.

The present reviewer is the more inclined to dissent from the above-quoted statements as to the origin of the Spitsbergen fiords because the statements are supported by reference to the "numerous indubitable fault-steps in southern and middle Sweden," which are also regarded as the result of deformation, not significantly modified by erosion. Yet observation on the ground, as well as a study of detailed topographic and geological maps of that interesting region, gives good reason for believing that these steps are not fault scarps, in the sense of being in the main directly due to faulting and only slightly modified by later erosion, but are resequent fault-line scarps, in the sense of being due wholly to the action of erosion on a faulted mass, the original displacements of which took place so long ago that after the broken surface was base-leveled a regional elevation permitted the excavation of the weaker strata on one side of the fault lines, thereby leaving the stronger crystalline rocks on the other side in the form of somewhat battered and dissected scarps, the height of which does not necessarily bear a close relation to the throw of the original faults. Swedish geologists who have interpreted these scarps as directly due to faulting do not seem to have considered the possibility of the alternative interpretation, much less the good reasons that support it. In view of the alternative explanation, it is permissible to believe not only that the mid-Swedish escarpments are not fault scarps but also that the Swedish school of fiord interpretation seriously underestimates the importance of erosion in producing fiords, whether the fiord region was previously deformed on fiordlike lines or not.

W. M. DAVIS

ANDERSON, R. M. **Recent zoological explorations in the western Arctic.** *Journ. Washington Acad. of Sci.*, Vol. 9, 1919, No. 11, pp. 312-314.

BROWN, R. N. RUDMOSE. **The present state of Spitsbergen.** Map, ills. *Scottish Geogr. Mag.*, Vol. 35, 1919, No. 6, pp. 201-212.

EKBLAW, W. E. **The plant life of northwest Greenland.** Ills. *Natural History*, Vol. 19, 1919, No. 3, pp. 273-291. Amer. Museum of Nat. Hist., New York.

HOLME, J. G. **Stefansson in the Arctic: A summary of what was done in the five years of the Canadian Expedition.** Ills. *Scientific American*, Vol. 120, 1919, June 7, pp. 603 and 615-616.

HOLMSEN, GUNNAR. **Spitsbergens jordbundsis og de bidrag dens undersøkelse har kunnet gi till forstaaelsen av de i arktiske land optraedende varige isleier i jorden.** Map, diagr., ill. *Norske Geogr. Selskabs Aarbok*, Vol. 24, 1912-13, pp. 1-132, with summary in German pp. 133-144. Christiania.

HOLTEDAHL, OLAF. **Report of the 2nd Norwegian Arctic expedition in the "Fram" 1898-1902, No. 36: Summary of geological results.** 27 pp.; map, ills. Christiania, 1917. [Contains map showing surface geology of the coast of Ellesmere Land and some interesting photographs.]

ISACHSEN, GUNNAR. **Green Harbour.** Map, ills. *Norske Geogr. Selskabs Aarbok*, Vol. 24, 1912-1913, pp. 151-161. Christiania.

PORSILD, M. P. **Om de Grönlandske Isfjordes saakaldte Udskydning.** Maps. *Geogr. Annaler*, Vol. 1, 1919, No. 1, pp. 149-157. Stockholm.

SPEERSCHNEIDER, C. I. H. **The state of the ice in the arctic seas, 1915.** 24 pp.; maps. *Dansk Meteorol. Inst. Nautisk Aarbog*, 1915. Copenhagen. [Abstracted in the *Review*, Vol. 2, 1916, p. 310.]

WORLD AS A WHOLE AND LARGER PARTS

BREASTED, J. H. **The place of the Near Orient in the career of man, and the task of the American Orientalist.** *Journ. Amer. Oriental Soc.*, Vol. 39, 1919, Part 3, pp. 159-184.

This address marks a new point of departure in the study of history and of historical geography.

In the first place Professor Breasted insists upon the necessity of comparative study in history. This he demonstrates convincingly by a comparison of the two areas on the globe in which alone man has risen from Stone Age savagery to the possession of agriculture, metals, and writing. One of these is in the New World, and the leaders in this region were the Mayas of Yucatan, the Nahuas of Mexico, and the Incas of Peru. The

other is in the Old World, and the leaders there were the peoples of the Nile and the Euphrates valleys. Each of these regions lies along, or on both sides of, a great intercontinental bridge, one joining the two Americas, the other connecting Africa and Eurasia.

In the second part of his paper Professor Breasted urges the imperative need for considering every phase of evidence in the study of man. Hitherto historians have been content to restrict themselves to the evidence of written documents. Hereafter they must be prepared to utilize the data supplied by archeology, prehistoric remains, physical anthropology, botany, agriculture, animal life and domestication, geology and paleontology, hydrography.

The fact is that departments, not only of Oriental studies, but of the "humanities" in general are built up on the model of a traditional department of Greek or Latin organized to teach languages. In the presence of modern problems such an arrangement is futile: we must begin to study *man* and not a branch of "polite" learning. In the new undertaking we must be prepared to consider all the available evidence, of every kind and character, that will throw light on the conditions of human life in the past.

FREDERICK J. TEGGART

LEVINE, I. D. **The resurrected nations: Short histories of the peoples freed by the great war and statements of their national claims.** viii and 309 pp.; maps. Frederick A. Stokes Co., New York, 1919. $1.75. 7½ x 5.

LYONS, H. G. **The winter climate of the eastern Mediterranean.** *Quart. Journ. Royal Meteorol. Soc.*, No. 178, Vol. 42, 1916, pp. 65-84. London.

SALAVERRÍA, J. M. **Los conquistadores: El origen heroico de América.** 219 pp. Rafael Caro Raggio, Madrid, 1918. 3 pesatas 50. 7½ x 5.

SANTIBÁÑEZ, ENRIQUE. **Historia de la América Latina.** 257 pp.; maps, ills. D. Appleton & Co., New York, 1918. 7 x 5.

STODDARD, LOTHROP, AND GLENN FRANK. **Stakes of the war: Summary of the various problems, claims, and interests of the nations at the peace table.** xiv and 377 pp.; maps, bibliogr. The Century Co., New York, 1919. 8½ x 5½.

—— ***World, International map of the,*** 1:1,000,000. Sheets: (1) ***Madras***, N. D-44. (2) ***Godavari***, N. E.-44. Survey of India, Calcutta, 1916. [These two sheets together cover the southeastern coast of India east of 78° E. and south of 20° N.]

MATHEMATICAL GEOGRAPHY

SURVEYING AND GEODESY

HAMMOND, J. H., JR. **The aero radio surveying and mapping.** Map, diagr. *Flying*, Vol. 8, 1919, No. 2, pp. 160-161 and 184. New York. ["System of aerial radio survey which will be used by Captain R. A. Bartlett in his expedition to explore the unknown regions of the earth in the Arctic Basin."]

JONES, E. LESTER. **The aeroplane in surveying and mapping.** Map, ill. *Flying*, Vol. 8, 1919, No. 5, pp. 438-441, 472, and 476. New York.

RIVERA, JOSÉ DE. **Trabajos geodésicos recientes y progresos en los instrumentos y métodos de la geodesia, topografía y cartografía.** Bibliogr. *Publs. Soc. de Geogr. Comerc. de Barcelona No. 13*, 1918, pp. 9-32.

PHYSICAL GEOGRAPHY

GEOPHYSICS

BAUER, L. A. **Relation between the secular variation of the earth's magnetism and solar activity.** Diagrs. *Terrestr. Magnet. and Atmospher. Electr.*, Vol. 23, 1918, No. 1, pp. 1-22; No. 2, pp. 61-68. Washington, D. C.

BERROTH, A. **Die Erdgestalt und die Hauptträgheitsmomente A und B der Erde im Äquator aus Messungen der Schwerkraft.** *Beiträge zur Geophysik: Zeitschr. für Physikalische Erdkunde*, Vol. 14, 1916, No. 3, pp. 215-257. Leipzig.

DUNOYER, L. **L'exploration magnétique des mers et les progrès du magnétisme terrestre durant la première moitié du XIXe siècle.** Maps, diagrs. *Rev. Gén. des Sci.*, Vol. 23, 1912, No. 2, pp. 46-59.

FRITSCHE, H. **Détermination des éléments magnétiques pour toute la face de la terre et de leurs variations séculaires, basée sur la théorie de Gauss et les observations.** *Atti X Congr. Internaz. di Geogr., Roma, 1913*, pp. 717-739. Reale Società Geografica, Rome, 1915.

HOBBS, W. H. **Assumptions involved in the doctrine of isostatic compensation, with a note on Hecker's determination of gravity at sea.** Maps. *Journ. of Geol.*, Vol. 24, 1916, No. 7, pp. 690-717.

TERADA, TORAHIKO. **On rapid periodic variations of terrestrial magnetism.** 85 pp.; diagrs. *Journ. College of Science*, Vol. 37, 1917, May 25. Imperial University of Tokyo.

METEOROLOGY

HENRY, A. J. **Increase of precipitation with altitude.** Diagrs. *Monthly Weather Rev.*, Vol. 47, 1919, No. 1, pp. 33-41. [Read before the Association of American Geographers, Baltimore, Md., Dec. 27, 1918.]

HILDEBRANDSSON, H. H. **Résultats des recherches empiriques sur les mouvements généraux de l'atmosphère.** 50 pp.; maps, diagrs. *Nova Acta Reg. Soc. Sci. Upsaliensis*, Ser. 4, Vol. 5, 1918, No. 1. Upsala.

HUMPHREYS, W. J. **Some recent contributions to the physics of the air.** Diagrs. *Science*, No. 1259, Vol. 49, 1919, February 14, pp. 155-163; No. 1260, February 21, pp. 182-188. [The temperature of the upper air, the law of wind increase with elevation, barometric fluctuations (ripples and semi-diurnal changes), and atmospheric electrical phenomena are discussed.]

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LYONS, H. G. **Meteorology during and after the war.** *Journ. Royal Soc. of Arts*, No. 3455, Vol. 67, 1919, February 7, pp. 167-180 (discussion, pp. 177-180). London. *Nature*, No. 2575, Vol. 103, 1919, March 6, pp. 12-16. London. [The latter based on the former.]

MARRIOTT, W. **Some facts about the weather: A popular meteorological handbook.** 2nd edit., revised. 37 pp.; maps, diagrs., ills., bibliogr. Royal Meteorol. Soc., Edward Stanford, London, 1909. 6d. 8½ x 5½.

REBOUL, G. **Relation entre les variations barométriques et celles du vent au sol: Application à la prévision.** Diagr. *Comptes Rendus de l'Acad. des Sci.* [*de Paris*], Vol. 166, 1918, No. 3, pp. 124-126.

SANDSTRÖM, J. W. **Über die Wirbelbewegungen in der Atmosphäre.** Diagrs. *Arkiv för Matematik, Astronomi och Fysik*, Vol. 7, 1912, No. 30, pp. 1-33. Upsala and Stockholm.

PHYTOGEOGRAPHY AND ZOÖGEOGRAPHY

ANDREWS, R. C. **Whale hunting with gun and camera.** xxii and 333 pp.; ills., index. D. Appleton & Co., New York and London, 1916. $2.50. 8 x 5½.

COWARD, T. A. **The migration of birds.** ix and 137 pp.; maps, bibliogr., index. (Cambridge Manuals of Science and Literature.) University Press, Cambridge, 1912. 50 cents. 6½ x 5.

LAUFER, BERTHOLD. **The reindeer and its domestication.** *Memoirs Amer. Anthropol. Assoc.*, Vol. 4, 1917, No. 2, pp. 91-147. Washington, D. C.

PAVILLARD, J. **Les progrès de la nomenclature dans la géographie botanique.** *Ann. de Géogr.*, No. 150, Vol. 27, 1918, November 15, pp. 401-415.

WATERMAN, W. G. **Plant ecology and its relation to agriculture.** *Science*, No. 1184, Vol. 46, 1917, Sept. 7, pp. 223-228.

HUMAN GEOGRAPHY

GENERAL

KOLLER, A. H. **The theory of environment, Part I: An outline of the history of the idea of *milieu*, and its present status.** 104 pp.; bibliogr. George Banta Publ. Co., Menasha, Wis., 1918. $1.00. 7½ x 5.

To the student of the influence of geographic environment this little book, which was written as an introductory chapter of a treatise on Herder's conception of *milieu*,

will prove exceedingly interesting and valuable, because it brings together, in convenient form, a wealth of material not readily available to the geographer.

The book is a brief résumé of the literature of the theory of environment from the earliest writings to the present. Complete references and numerous quotations are given, many of the latter being embodied in the text. An introductory note discussing the various words used in different languages to express the idea of *milieu*, or environment, is followed by two chapters, the first sketching the history of the idea of *milieu* down to the nineteenth century, and the second continuing the history from the beginning of the nineteenth century to the present. The second chapter is not strictly chronological but is divided into topics such as "Anthropogeography, Geography, and History"; "Geography and History"; "Primitive Peoples and Environment"; "Climate and Conduct," etc.

As a bibliography and convenient reference work on the literature of the theory of environment, this little book will find a ready welcome. JOHN L. RICH

ECONOMIC GEOGRAPHY

Production

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—— **Petroleum, The romance of.** *Nature*, No. 2548, Vol. 101, 1918, August 29, pp. 516-519. [Abridged from a discourse delivered at the Royal Institution, June 7, by Sir Boverton Redwood.]

PORRITT, B. D. **The rubber industry—past and present.** *Journ. Royal Soc. of Arts*, No. 3460, Vol. 67, 1919, March 14, pp. 252-267 (discussion, pp. 264-267). London.

SKINNER, J. J. **Soil aldehydes: A scientific study of a new class of soil constituents unfavorable to crops, their occurrence, properties and elimination in practical agriculture.** Diagrs., ills., bibliogr. *Journ. Franklin Inst.*, Vol. 186, 1918, No. 2, pp. 165-186; No. 3, pp. 289-316; No. 4, pp. 449-480; No. 5, pp. 547-584; No. 6, pp. 723-741. Philadelphia.

THORPE, T. E. **Sources of potash.** *Nature*, No. 2514, Vol. 100, 1918, Jan. 3, pp. 344-347. [See note in the *Review*, Vol. 5, 1918, p. 149.]

WALTON, C. L. **The effect of geographical conditions on agriculture.** *Scottish Geogr. Mag.*, Vol. 34, 1918, No. 11, pp. 415-428.

HISTORY OF GEOGRAPHY AND EXPLORATION

BARATTA, MARIO. **Cesare Battisti—geografo, martire.** Ill. *Quaderni Geografici*, Vol. 1, 1918, No. 1, pp. 1-32. Novara.

BECKER, JERÓNIMO. **Trabajos geográfico-astronómicos de los hebreos peninsulares durante la alta Edad Media.** *Bol. Real Soc. Geogr.*, Vol. 60, 1918, No. 1, pp. 89-113. Madrid.

BELTRÁN Y RÓZPIDE, RICARDO. **Cristóbal Colón y Cristóforo Columbo.** *Bol. Real Soc. Geogr.*, Vol. 60, 1918, No. 3, pp. 359-376. Madrid.

BRIGHAM, A. P. **Geography after the war.** *Educ. Rev.*, Vol. 57, 1919, No. 4, pp. 277-285. New York.

FROIDEVAUX, HENRI. **Le baron Hulot.** Ill., bibliogr. *La Géographie*, Vol. 32, 1918, No. 4, pp. 211-225. Paris. [An appreciation of the services rendered by the distinguished traveler and writer, Étienne Hulot, who from 1897 till his death in 1918 was General Secretary of the Société de Géographie. A list of his published works accompanies the biographical sketch.]

—— **Geologists, Eminent living: Dr. Charles Doolittle Walcott.** Ill. *Geol. Mag.*, Decade 6, Vol. 6, 1919, No. 1, pp. 1-10. London.

HOBBS, W. H. **The making of scientific theories.** Reprinted from *19th Rept. Michigan Acad. of Sci.*, 1917, pp. 19-32. Lansing. [Address of the President, delivered March 28, 1917.]

LATORRE, GERMÁN. **Diego Ribero, cosmógrafo y cartógrafo de la Casa de la Contratación de Sevilla.** *Bol. Centro de Estudios Amer. de Sevilla*, No. 20, Vol. 5, 1918, pp. 27-31; No. 21, pp. 18-35.

ROGNONI, RACHELE. **Sui documenti contradditori relativi a Cristoforo Colombo.** *La Geografia*, Vol. 6, 1918, No. 6, pp. 428-434. Novara.